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MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

FEBRUARY AND MARCH, 1874.

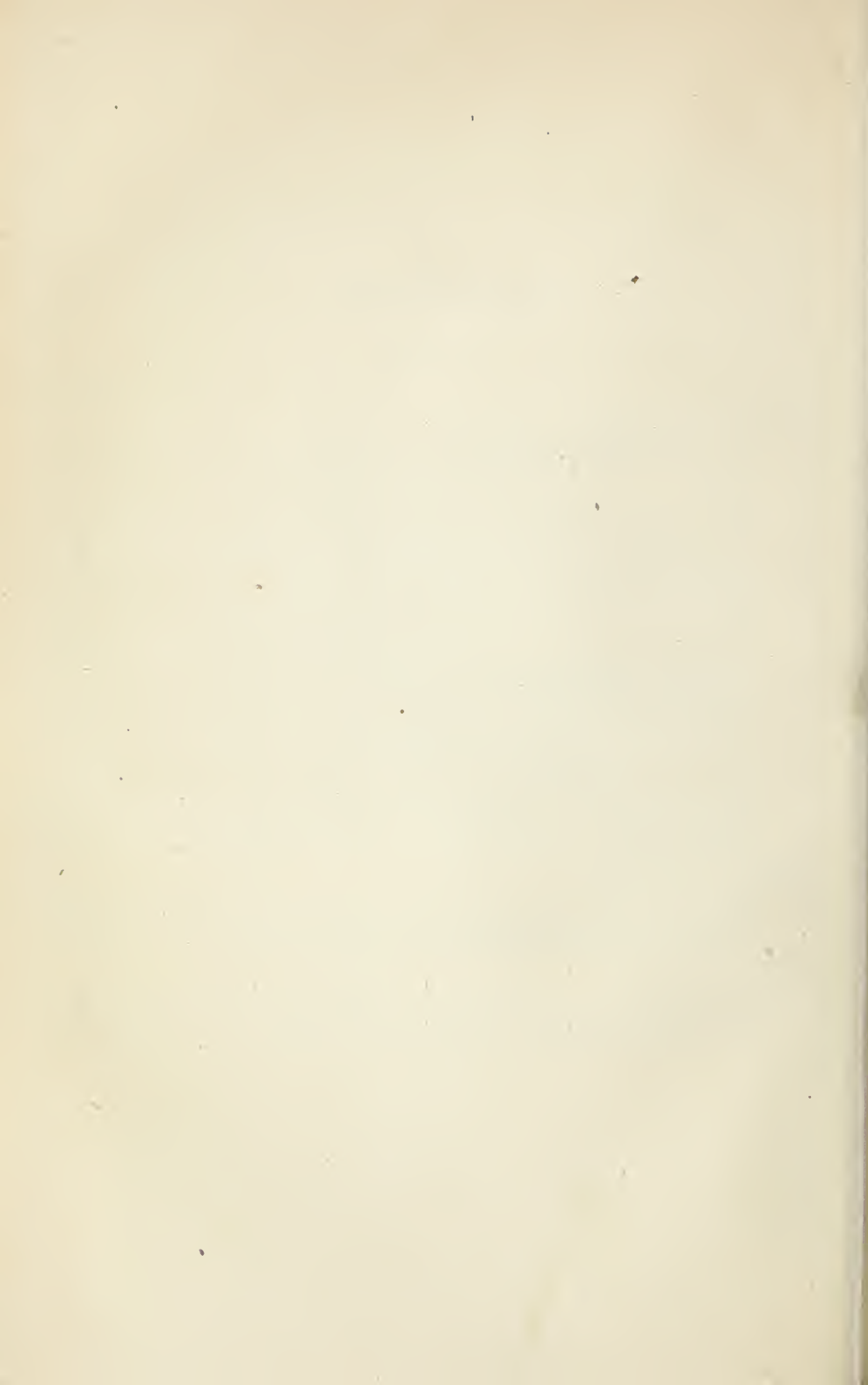


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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,

Statistical Division, March 25, 1874.

SIR: I present herewith, for publication, a digest of the returns of March upon certain tendencies of progress in agriculture, with the results of a special statistical investigation of the status of the last cotton-crop, as to comparative quality, causes of injury, length of cotton season, &c.; a statistical inquiry relative to the quantity and quality of the tobacco-crop; a synopsis of a recent Austrian official report on forest-culture; chemical memoranda; botanical notes; market reports, &c.

Respectfully,

J. R. DODGE,

Statistician.

Hon. FREDERICK WATTS,

Commissioner.

REPORT ON CONDITION OF AGRICULTURE.

THE MOST PROFITABLE CROPS.

What branch of agriculture has been most profitable in your county the past year?—This was one of the inquiries in our circular returnable March 1. Our correspondents have very generally responded. A demonstration of superior absolute profit in the culture of particular crops was not intended, as profits vary from year to year, with changing conditions of supply and demand. Profits also vary with variable fertility of soil, adaptation of soil to crops, and differing skill and economy in culture. Aside from these causes of difference of opinion and statement, another prominent bar to such a demonstration would inevitably be the want of accurate record of expense and receipts, the general neglect of thorough book-keeping in farm accounts, resulting in fragmentary or incomplete statements. Nor would a mere record of current receipts and disbursements suffice; it would be necessary to calculate exactly the value of both manures and manipulation upon crops of subsequent years—a height in the mathematics of farm economy to which neither practice nor science has fully attained. It was believed, however, that valuable data, even though fragmentary, would be obtained relative to the cost and income of particular crops, showing incidentally the amount and kind of culture, the local yield and prices; and also that expressed preferences of different sections would show in a general way what are actually the popular and paying branches of husbandry, as at present managed, in those localities. The number of these details

has been so great that only the most suggestive and important facts are given.

Generalizing very briefly the results of this investigation, as to the industries popularly esteemed most productive, local preferences are as follows: In Maine, hay occupies the first place and dairy-husbandry the second; hay and stock-raising are of equal importance in New Hampshire; dairy-husbandry stands high in its predominance in Vermont; in Massachusetts, hay first, market-gardening next; the garden and the dairy divide the honors in Rhode Island; and tobacco stands first in Connecticut. There is much diversity in New York, but dairy-husbandry is far in advance, being the choice of one-third of the counties. There is much variety in New Jersey, though market-gardening stands first. In Pennsylvania, manufacturing and mining make a varied production most popular, few counties indicating very decided preferences, though wheat (as few would suppose) holds the first place in one-sixth of the counties. In Delaware, tobacco; in Maryland, tobacco and fruit growing. Of more than fifty Virginia counties expressing decided preferences, 16 favor tobacco, 9 "mixed husbandry," 6 corn, 5 stock-raising, 5 market-gardening, and others pea-nuts, sheep-husbandry, fruit-growing and wheat. In North Carolina corn stands numerically before cotton. In Florida sugar-cane is preferred, while cotton predominates in South Carolina, Georgia, Alabama, Mississippi, and in Texas. In Arkansas corn stands first; and in Tennessee hay and corn are preferred. In West Virginia, corn and stock-growing; in Kentucky, tobacco and corn; in Ohio, great diversity appears—sheep-husbandry, corn, general cropping, wheat, hay, and fruit growing; and in Michigan a similar variety—wheat, dairying, and fruit-growing. Corn is king in Indiana and hay prime minister. Corn is also first in Illinois and wheat next. In Minnesota, wheat; in Wisconsin, wheat and the dairy; in Iowa and Missouri, stock-growing, corn, and wheat. The order in Kansas and Nebraska is wheat, stock-growing, and corn. In California, wheat, sheep-husbandry, and fruit-growing. In Oregon, wheat and stock-growing.

One of our correspondents, after setting forth the impoverishing results, in the long run, of the single-crop system and dependence on imported supplies and fertilizers, says: "Our intelligent farmers are waking up to the necessity of improving the land and considering *that* a part of the year's profit. When they do that and get some of our old fields now worth \$4 to \$10 per acre to be worth \$50 per acre, then our people will begin to open their eyes to their best interests." Many more fail to see the all-important distinction between the return above expenditure of so much per acre and the per cent. of profit on the amount expended. For instance, a farmer reports that cotton was more profitable than corn, and proves it by exact statistics which show that, after deducting in both cases all expenses up to sale, the cotton returned per acre \$3 more than the corn. But the same statistics show that the corn returned 175 per cent. on the cost of producing and the cotton only about 68 per cent. That is, 3 acres of corn, yielding a profit of \$14 per acre, could have been cultivated at less cost than 1 acre of cotton yielding a profit of \$17.

There is no vocation in which a well-trained judgment, and a knowledge of the principles and practice upon which success depends, are more important or pay better than in that of the farmer. The size of the farm; the amount of additional capital required; the adaptation of soil and climate; the practicability of obtaining labor and the expediency of employing it at the cost; the distance from market and

cost of transportation ; the difference between a certain and uncertain, and a constant and intermittent, cash-market ; comparative uniformity or great fluctuations in prices ; comparative risks in producing different crops ; the relative per cent. of profit in the expense of producing ; the relative advantages of producing market-crops with which to purchase supplies and fertilizers, or producing them on the farm, thus avoiding transportation both ways ; the time intervening between the outlay and the return ; the comparative advantages between cultivating crops to be sold off the farm and crops to be utilized and concentrated in value on it ; the relative profits of systems which furnish profitable employment for labor and work-animals longer and shorter portions of the year ; and, above all, the anticipated result, after a series of years, on *the productiveness of the farm itself*, the farmer's invested capital—these are some of the more prominent considerations which the intelligent farmer takes into account in deciding what branch of farming will be most profitable for him ; and the following extracts will afford many illustrations of the fact that, in all sections of the country alike, as a rule, the degree of permanent success or continued failure of success is in proportion to the degree in which they are regarded or overlooked.

These extracts also furnish several striking illustrations of the great advantages resulting to a farming community by the establishment, either by their own or other agency, of mechanical or manufacturing industries. In Columbia, N. Y., mills for the manufacture of straw-paper make rye one of the most profitable crops raised. In Butler, Pa., in consequence of recent developments of oil production, "towns and improvements have sprung up as if by magic, scattering millions of dollars among land-owners," and causing "an unprecedented demand, at high prices, for every article the farm can produce for man or beast." In Mercer, also, iron manufactories and oil production "make a cash demand for cattle, cheese, and butter;" and in Luzerne, in consequence of mining operations, farm products of every kind find a ready market at good prices."

COTTON.

The purport of the returns from the cotton States is this: Nothing pays but cotton, and cotton does not pay. Every season of large production and consequent decline of prices wakes the echoes of the old wail of ruin. Like all statements of individual views of comparative profit in any branch of industry, these are various and apparently contradictory, the difference in part consisting in widely different rates of yield and cost of culture, and in part in the varying judgment of the observers and their differing views as to what profit may be deemed remunerative. Supposing these differences harmonized, there is another important element of error which the majority of our correspondents have apparently not considered. They simply deduct expenditures from receipts, without inquiring whether they have enriched or depleted the soil. Many report gratifying success from the first or second annual application of commercial fertilizers ; many others, in giving the history of further applications, say that they fail to yield the former return. When such results follow, the first success was only apparent, not real.

Another defect in reasoning is very apparent. Many appear to deduce, from a clear showing that an acre of cotton yields a larger net return than an acre of corn, or that \$100 expended in the culture of cotton produces more money than a similar sum used in the production

of corn, the conclusion that the exclusive culture of cotton in the present exhaustive mode is more profitable than rotation with other crops upon a recuperative basis. Herein lies the whole question of the future profit of cotton culture. Our correspondents, now and heretofore, furnish facts to prove the possibility of growing more than the present amount of cotton on half of the area now cultivated, leaving the remainder to produce, with little added cost, an abundance of corn, beef, pork, wool, fruits, etc. This can be accomplished by a system which shall make the soil more productive than at present, while it is undeniable that the mode of culture now and heretofore practiced renders the soil less productive.

Will planters continue the old practice? Many correspondents think a new departure is pending. It has often been promised before. The first rise in cotton has usually buried the impulse in oblivion. The difficulty is, as one correspondent has foreseen, the present race of planters know better than outsiders how to "make cotton," but very few of them have learned how to do it without injury to the soil. They can only obtain golden eggs by killing by inches the goose that produces them.

NORTH CAROLINA.—*Craven*: The only crop for money or exportation; \$50 per acre may be counted as the maximum yield, though some, by extra care and culture, have produced three times as much. *Montgomery and Tyrrell*: Cotton and corn the chief products; corn, being heavier in proportion to value, costs more for transportation, and therefore brings the producer less money. *Pitt*: The crop from which the tillers of the soil expected to realize the most profit; but, in consequence of the low price, many have failed in their expectations, and are obliged to curtail their operations for the ensuing year. *Chowan*: Although most profitable, the low price has caused several farmers to fail. Farmers begin to learn by experience that cotton will not do to depend upon. *Catawba*: One acre will produce 350 pounds of lint, at 14 cents, \$49; cost of fertilizers, \$6.30; preparing ground, cultivating, and gathering, \$18; net profit, \$24.70. *Moore*: Almost the only medium of money circulation among the farmers.

SOUTH CAROLINA.—*Williamsburgh*: About the only crop. Some few farmers who did their own work or hired on specially favorable terms may have cleared enough to pay taxes after supplying their families. *Chesterfield*: The crop was below the average, and the price scarcely sufficient to pay the cost of production, leaving the planter with no margin to support his family or as compensation for his services and interest on investment. Even those who did their own work have failed in most instances to pay for supplies consumed in making the crop. *Lexington*: Most profitable, but even that has fallen very far below the profits of the previous year. *Laurens*: The all-absorbing crop. A good and full crop was made; but little margin to the producer. *Chester*: The only product to which our people look for profit; yield average, but price too low to be remunerative. *Barnwell*: Notwithstanding the low price, and the failure of many planters and the bankrupting of a large portion, those who managed the business in a business way with their own capital realized a larger per cent. on investment than those engaged in other branches. From actual experience you have the following statement: Five hundred acres of land, at \$4 per acre, \$2,000; work-animals, \$800; implements, \$300; total capital, \$3,100; laborers sufficient for this farm, 200 acres in cultivation, working on half time, supporting themselves, make for the proprietor 30 bales of cotton, of 500 pounds each, worth \$60 per bale, \$1,800. Deduct for fertilizers, \$300; use of work animals, \$250; of implements, \$50; annual repairs, \$225; taxes, \$75; total, \$900; clear profit, \$900. The feed of the work-animals is replaced by their work in addition to the cotton, and the cotton-seed and manure pay for ginning, bagging, and ties.

GEORGIA.—*Hall*: Before the war not 100 bales of cotton were made in this county. We have marketed this year over 5,000 bales, most of which was grown here. *Brooks*: Not, however, so remunerative as it would have been had not the planters bought so largely of fertilizers. *Whitfield*: I planted 4 acres; used 500 pounds of Stonewall guano, which cost \$20, and raised 3 bales, 500 pounds each. A neighbor planted 20 acres, common upland, without using any fertilizer, and raised 11 bales, averaging 500 pounds. Another planted 22 acres without manure and raised 15 bales. Another planted 1 acre, using stable-manure, and raised 2,200 pounds of seed-cotton. *Gordon*: Our poorest land for the past two years has yielded more per acre than our richest land in cereals. *Upson*: Many who have managed their farms well and had a little money ahead have lost it all, and those who were in debt are worse in debt than ever. We do but little in the way of diversifying or rotating crops. Upon an average we plant

about two-thirds of our land in cotton and the remaining third in corn, and call that our crop. *Muscogee*: It did not pay the cost of production. *Forsyth*: In several instances lands which were worn out and would not produce 200 pounds seed-cotton per acre, by the use of fertilizer made, after paying for fertilizer, \$20 per acre. Some did even better; in one instance one acre of old, worn-out land, after deducting cost of guano, netted \$70. *Douglas*: Cotton is made a specialty by many to the neglect of making meat and bread, and, to my knowledge, but few have made money the past year, and those are the few who did not use any commercial fertilizers, and raised their own meat and bread. *Dooly*: Planters expected to realize 18 cents for their cotton, and made heavy liens for their provisions. At the maturity of the liens, cotton was selling at 11½ to 13 cents, hence a large number were forced into bankruptcy to protect themselves against their heavy liabilities. Others sold off a portion of their stock, and are farming on a smaller scale this year. *Wilkes*: Cotton was the crop. Those who raise most supplies, and devote the rest of their time to cotton, have, not only in the past year, but in the olden times, succeeded best. They were before the war, and still are, the money-lenders outside of banks and regular capitalists. *Earle*: On 8 acres four laborers, with two horses, made 16 bales, besides corn, fodder, oats, pease, and potatoes to run the farm another year. This, however, is above an average. *Pulnam*: A larger crop made than ever before—about 9,000 bales. *Columbia*: Less guano used, less cotton and more food-crops will be the motto this year. *Madison*: Commercial fertilizers pay a better percentage in Northeast Georgia than in any other portion of the State, from the fact that we are too far north for fruit on cotton, (without such stimulants,) owing to the shortness of the season. With the aid of fertilizers we make fine yields. It does not require much skill to raise 300 pounds of lint-cotton on poor land.

FLORIDA.—*Tallahassee*: The county has not more than made a living for the past two years. *Madison*: Has been deemed most profitable. No statistics are or can be given which show this to have been the case, except that almost every farmer planted more or less cotton, generally as much as he could tend. The larger farmers have been falling behind every year, and a majority of the larger farms are cursed with liens for the last and previous years. There now appears to be a determination on the part of planters to make their farms self-supporting, as has been the case heretofore with the smaller farmers who did not use colored labor extensively.

ALABAMA.—*Clarke*: For the last two years it has failed in amount of production, and prices have been low, particularly the last year, and, therefore, instead of a paying crop, it leaves the planters largely in arrears with their factors. *Montgomery*: Either corn or hay might have been made more profitable than cotton, but provision-crops are of secondary consideration in this county. *Conecuh*: The only thing that has been cultivated on anything like a large scale, and I am fearful that it will be so for years to come. *Lauderdale*: The only branch followed for profit; about two-thirds of the land cultivated is planted in cotton. *Randolph*: Nearly every one planted his best lands in cotton, bought fertilizers extensively, to be paid for in cotton by the first of November, at 15 cents per pound, (instead of which many subsequently agreed to pay cash, with 2 per cent. per month added, in anticipation that cotton would be higher.) They also made and used home fertilizers. The summing up of the whole is, we made a good crop, at large expense, and realized considerably less than cost. Corn is selling at \$1. This last year has taught many a lesson I hope they will not forget. *Franklin*: Almost exclusively relied on here for money. A simple statement of the cost of production will show that, at present prices, it is cultivated at a loss. *Butler and Pike*: As a rule farmers mortgage their stock, lands, and growing crop to procure supplies with which to make cotton, and at the end of the year are in a worse pecuniary condition than at the commencement. *Limestone*: It will not pay the expense of growing. *Blount*: A vigorous effort was made last year to raise a large crop of cotton. The crop was good; about \$150,000 worth was raised in the county, mostly by white labor. But the price scarcely covered the cost of production. *Calhoun*: The best and only paying crop.

MISSISSIPPI.—*Pike*: The crop resulted, in most instances, in a loss to the cultivator. *Grenada*: Every other crop has been unprofitable, owing to neglect and bad culture, and the cotton crop short and unprofitable, owing to disorganized labor, bad culture, &c. *Kemper*: Did not return the cost of production. *Yalabusha*: Has not proved very profitable the past year. *Madison*: The majority of the farmers are in debt, and to a certain extent are compelled to cultivate cotton, to hand over to the merchants whom they owe, as the latter advance the supplies on the condition that the cotton be shipped to them. *Attala*: We consider the cotton crop the most profitable, yet we must acknowledge that this seems unreasonable. While the cotton crop requires the labor of the entire year, corn, sugar-cane, and potatoes, sweet and Irish, can be raised by half the labor. The difference in result is that the cotton crop, great or small, can be sold for cash, while the other products cannot, and herein is the secret of the rage, as we call it, for cotton. *Claiborne*: No branch profitable, save in a few instances in which the labor was done, or directed and controlled, by white men. *Smith*: The principal branch, but do not think, as now followed, it is profitable.

TEXAS.—*Parker*: Owing to the continual depredations of the grasshoppers until the season was too far advanced for corn, oats, &c., no other crop was profitable. *Hood*: Yielded the largest return per acre. Wheat and all cereals were seriously damaged by late freezes and grasshoppers. *Montgomery*: Nothing else is raised for export, and not more cotton the past year than enough to cover expenses and purchase bread-stuffs. *Fort Bend*: The only branches followed with a view to profit are cotton mainly, and sugar to a limited extent; both of which have proved unprofitable in the last two or three years, involving planters more and more. *Still*: We have made at least 5,000 bales, which have sold at \$60 per bale, \$300,000.

ARKANSAS.—*Sebastian*: Being the main staple, producing it at the prices that have been paid for it, 9 to 12 cents in the lint, is a losing business. We do not raise a sufficiency of corn, wheat, rye, oats, and potatoes for home consumption. *Jackson*: That it is more profitable to plant *all cotton* and purchase corn North is believed and practiced by many of our oldest and most successful planters; it is, however, the opinion of the majority that it pays better to raise all the planter needs at home and less cotton. *Sharp*: Where the soil is rich and not sandy, corn pays as well.

CORN.

The cases classed under this head are for the most part limited to corn produced and sold directly in the market. Extensive returns one year ago, in response to an inquiry respecting the relative profit on corn when sold in the market and when fed on the farm, so as to return an equivalent for what it takes from the soil, and to diminish the cost of transportation by concentrating its value, seemed to show, so far as weight of testimony from experience and observation can, that farmers who practice feeding out the corn they raise get a larger profit than those who practice selling it. As a rule, this conclusion is sustained not only by results of annual statistics, but still more decidedly by contrasted results, on farms and in pockets, after practice for a series of years. In regard to the relative profit in producing corn and cotton, the return from Green, N. C., reports that corn can be produced with some profit at 80 cents per bushel, while cotton, at 13 cents per pound, will not clear expenses, and adds: "Cotton is now selling at 12½ cents, and corn very readily at \$1." Another return from a county where much more cotton than corn is produced, expresses the opinion that the greater expense in producing the former, and the greater fluctuations in the price, make the profits, in a series of years, "far inferior to those of corn."

PENNSYLVANIA.—*Clearfield*: We know of many fields which, according to the accredited number of acres, yielded from 100 to 120 bushels of ears to the acre the last season, though these figures are considerably above the average.

VIRGINIA.—*Washington*: One man states that he raised 800 bushels on 8 acres. *Orange*: On some farms 40 and 50 bushels of corn per acre were harvested, and in one instance 90 bushels per acre were gathered from 12 contiguous acres in a field of 25 or 30 acres. *Middlesex*: The average price in this county for three years has not fallen below 80 cents. This may be accounted for in part by a local demand caused by the absence of thousands from the farms, who are seeking a living on the vast oyster-beds of every river in this section. *James City*: The cost and profits of cultivating an acre of corn and an acre of oats of the same soil and fertility were as follows: Total cost of cultivating and harvesting the corn, \$13.12; returns, 3 barrels of corn, \$24; shucks and fodder, \$7; profits, \$17.88. Cost of cultivating and securing the oats, \$9; returns, 3,000 pounds of oats, at 60 cents per 100 pounds, \$18; profit, \$9.

NORTH CAROLINA.—*Clay*: The leading crop. *Mitchell*: I planted on good upland, without manure, 8 acres; gathered, November 1, 240 bushels; placed it in a crib by itself, and on the 17th of February it measured 232 bushels; worth, at 75 cents, \$174; cost of cultivating, &c., \$34.80; net profit, \$139.20. *Haywood*: As a general thing the wheat crop is the most profitable, but last year it fell off about two-thirds of a crop, leaving the corn crop in advance of all others. *Burke*: Our principal crop for market which is sure, and pays generally very well. *Pamlico*: The price is about 80 cents per bushel, and the yield generally good. *Gum*: While corn was selling at 80 cents per bushel, cotton was selling at 13 cents per pound. Corn can be produced at some profit at 80 cents, while cotton at 13 cents will not clear expenses. Cotton is now selling at 12½ cents, and corn very readily at \$1. *Polk*: The principal crop. *Stanly*: Though much more cotton than usual has been produced, the

greater expense in its production and the great fluctuations in price make the profits far inferior to those of corn. Where a planter made 100 barrels of corn with great ease, and could sell the crop for \$500, he would have been obliged to make 10 bales of cotton of 400 pounds to the bale, which would have overtaken his available labor and capital. *Greenville*: Last season a man and his wife, with a team of bulls, planted four acres in cotton, worked the land well, manured in the row from the barn-yard 19 wagon-loads, and gathered 647 pounds of cotton in the seed, at $3\frac{1}{2}$ cents, \$22.62 $\frac{1}{2}$. The same land, with one-third less labor, put in corn, would have produced 15 bushels per acre, which, at 75 cents, (corn is now 90 cents,) would have brought \$45; 500 bundles of fodder, at \$2.50 per 100, \$12.50; shucks, (one load sells for \$10,) \$20; total, \$77.50.

GEORGIA.—*Fannin*: Corn occupies about two-thirds of the land under cultivation. There are other things that pay better, but they are raised on a small scale. Irish potatoes are very profitable; we raise 150 to 200 bushels per acre, worth 50 cents per bushel at home. Also cabbages, which are worth 5 to 8 cents per head, or 3 to 4 cents per pound. *Towns*: The principal crop raised in the county. *Jefferson*: He who neglected to make corn, relying upon cotton to pay for his fertilizers and furnish his supplies, had no cause for surprise to find himself unable to make both ends meet. This has been the practice and experience of hundreds of our planters.

ALABAMA.—*Saint Clair*: On lands which have been in cultivation continuously for thirty-nine years, I made 70 bushels of white corn to the acre; turned the land over in October, 1872, 10 inches deep; planted April 10; plowed and hoed three times. In addition to the corn I raised a quantity of cow-peas and a large number of pumpkins, but from experience I think the production of red clover, millet, and red-top or timothy pay me better, in proportion to the labor, than anything else. *Henry*: A few farmers made an average of over 20 bushels per acre. *Clay*: Corn has been more profitable than cotton for the reason that the farmers bought largely of counterfeit guano. Many of them did not make enough cotton to pay for the guano they used.

TEXAS.—*Anderson*: Being in the cotton-belt, it is natural for each cultivator to plant cotton, which is grown with great ease and facility; and even with miserably demoralized conditions of labor, the product of 1873 reached 10,000 bales, of 450 pounds each. Yet not an ounce of guano or other fertilizing material has ever been applied, except that, in isolated instances, barn-yard manure is carelessly applied, usually by the planters' children. But in regard to profit there is no question that maize yields the greatest. The average stands thus: Preparing, planting, and thinning 5 acres of corn, eight days' labor, \$8; plowing, six days, \$9; gathering corn and fodder, eight days, \$8. Total expenses, \$25. Yield of corn, 150 bushels, at 75 cents, \$112.50; fodder, 1,500 pounds, at \$1 per 100, \$15. Total, \$127.50; net profit, \$102.50. Preparing, planting, and thinning 5 acres of cotton, fifteen days labor, \$15; cultivating, twelve days, \$18; hoeing three times, ten days, \$10; gathering, fifty days, \$50; incidentals, \$10. Total expense, \$103. Yield, 5,000 pounds seed-cotton, 3 cents, 150; 120 bushels of seed, 25 cents, \$30. Total, \$180; net profit, \$77. *Atascosa*: From the fact that it has not required so much labor, and is less subject to worms. *Victoria*: The yield with ordinary culture has been 40 bushels per acre, worth \$30. One man with a good team of two horses or mules, can cultivate 30 acres with ease. *Upshur*: Last year our best lands produced about 22 bushels of corn per acre, worth \$1 per bushel, \$22; total cost of production up to sale, \$8; net profit, \$14, (or 175 per cent. in the outlay.) Our best cotton-land produced about 1,000 bushels of seed-cotton per acre, which will give 333 pounds of lint-cotton, worth 12 $\frac{1}{2}$ cents, \$41.62; 20 bushels of seed, worth \$2; total expense of producing up to sale, \$25; net profit, \$18.62, (or 74 per cent. on the outlay.) *Uvalde*: Our soils are best adapted to corn, and is surrounded by military posts which consume more corn than it produces, giving us the advantage of a near market.

ARKANSAS.—*Crittenden*: One hand can work fifteen acres; can easily raise 30 bushels per acre, worth 75 cents, \$337.50. Hire of hand and other expenses, \$275; net profit, \$62.50. *Madison*: Hogs that cost in February, 1873, \$1.35, after taking the mast in the fall, and being fed 5 bushels of corn each, sold readily for \$10. *Little River*: Experience since the war puts the maximum of cotton per hand at 6 bales, which at present prices would be worth \$324. The same hand would be able to attend to 20 acres of corn, which would require his attention for only a few months in the year. This 20 acres would produce 600 bushels, which, at \$1, would yield \$600; difference in favor of corn, \$276.

TENNESSEE.—*Decatur*: Worth 80 cents to \$1. *Hancock*: Yielding 25 bushels per acre, worth 50 cents per bushel.

WEST VIRGINIA.—*Jefferson*: On a field of 14 acres, 510 bushels of corn were raised, at a cost of 16 cents per bushel; the corn at time of gathering was worth 40 cents per bushel, yielding a clear profit of \$122.40, being \$8.74 per acre. The corn crop of 1873 aggregated 474,250 bushels, and was produced at an average cost of 20 cents per bushel, leaving a profit of \$7 per acre. The profit on the wheat crop will not exceed an average of \$5 per acre. *Cabell*: A farmer of this neighborhood received for raising corn \$13.50 per acre, the landlord taking two-fifths, the renter three-fifths; another received \$12 per acre, receiving one-third for rent. Tobacco generally does better, but this year has proved an exception.

KENTUCKY.—*Shelby*: Corn-fed hogs sold at 4 cents per pound, gross, equal to 40 cents per bushel for corn; after this a demand sprung up from distilleries, and the price advanced from 30 cents to 50 cents, and even to 60 cents per bushel, and at this last price our large surplus was disposed of.

OHIO.—*Pickaway*: The yield of corn upon well-managed farms amounted to from 40 to 75 bushels per acre. Some fields yielded 100 bushels per acre. The price realized from this crop will average 45 cents per bushel, and the product of an acre \$20.25 exclusive of the fodder, which is worth from \$1.75 to \$2 per acre. The cost of producing this crop and disposing of it will amount to an average of \$3.50 per acre, leaving a profit of \$13.50. Corn fed to hogs will average about the same. *Logan*: Corn has yielded the largest margin over expenses. Cost of raising 35 bushels of corn on one acre of land, \$9.50; value of corn, at 50 cents per bushel, \$17.50; value of fodder, \$1.50; total, \$19; deduct expenses of raising, and a clear gain remains of \$9.50.

INDIANA.—*Vanderburgh*: From 60 to 100 bushels of corn are raised on the river-bottoms. The yield in the interior is comparatively small, and 30 bushels to the acre is as much as the uplands will average. *Madison*: With us corn averages 38 bushels per acre, selling at an average price of 40 cents per bushel, making a value per acre of \$15.20. Wheat will yield 10 bushels per acre, at a selling-price of \$1.10 per bushel. The surplus corn is fed to hogs and cattle. Average price of hogs, (gross,) \$3.80 per hundred; price of fat cattle, 3 cents per pound, gross. *Ripley*: I have sold corn at the crib this winter for 60 cents per bushel, and wheat at \$1.50 per bushel, my corn averaging 50 bushels per acre, and wheat 15 bushels per acre. The average for corn (for the whole country) would be 30 bushels and for wheat 10 bushels per acre. No other branch of agriculture here pays so well, except a few isolated cases of hop-raising and haying. *Hamilton*: One great advantage in raising corn is that a man may avoid all high wages and expensive machinery; he may gather the crop at his leisure. At the present high price of corn there would be no profit in feeding it to hogs. *Martin*: Corn may be considered the main crop, and the average value per acre is greater than anything else cultivated here. The corn is principally fed to hogs, and they are mostly sold to agents who purchase for Cincinnati packers. *Franklin*: The best feeders here get from 10 to 16 pounds of pork to the bushel of corn; this at 5 cents per pound, will yield the producer from 50 to 80 cents per bushel for corn. The best corn-lands yield an average of 50 bushels per acre, giving a cash value per acre from \$20 to \$40, for the produce of the land, less the cost of production, interest and tax, but still yielding a balance in favor of the farmer greater than from any other crop. *Gibson*: Even at the low price of pork for the last two years, I have found more clear money in feeding corn to hogs and selling them for others to fatten. For example: I sold 75 stock-hogs for \$469.43, while the corn they ate at 45 cents per bushel, and the pasturage at \$1 per month, amounted to \$307.20, making a difference of \$162.23 in favor of the hogs. Corn and pork necessarily go together, and have proved the most profitable. *Miami*: There is but very little difference in the relative expense of raising our two principal crops—wheat and corn; of the latter we had about 30 bushels to the acre, and it has been selling for 50 cents per bushel; of the former we had about 15 bushels to the acre, selling at \$1.35 per bushel, and I believe this statement approximates the facts of the case for the past three years, although I am well aware the prevailing opinion of our Wabash Valley farmers is in favor of the corn-crop.

DAKOTA.—*Minnehaha*: The total expenses of raising 480 bushels of corn on a ten-acre field amounted to \$104.37; the crop sold at 60 cents per bushel, or \$288 for the crop, leaving a net profit of \$183.63. On a ten-acre field 250 bushels of wheat were raised. The crop sold for \$187.50, and the expenses footed up \$103.50, leaving a balance of \$82 for a profit. The crop of corn could be marketed at home, but the wheat must be taken hence for a market, and which would make the difference in favor of the corn still greater.

ILLINOIS.—*White*: Raising corn has paid better this season than any other crop, and is now in demand at 50 cents per bushel, shelled and sacked. Our wheat-crop was very light, and not of good quality; the average price per bushel was about \$1.30, and the same wheat brought \$1.50 a month ago.

MINNESOTA.—*Redwood*: All other products excepting corn have fallen off 50 per cent. in consequence of the grasshopper. Corn is now worth 60 cents per bushel, whereas wheat fetches only 75 cents; corn can be consumed at home, and wheat has to be shipped to a market.

IOWA.—*Wayne*: Corn with us is worth 40 cents per bushel, or \$16 per acre; the total expenses for raising the same amounts to \$3.50, leaving \$7.50 net profit. *Hardin*: We raise from 35 to 50 bushels of corn to the acre, and are selling it at from 40 to 45 cents per bushel, realizing about \$15 per acre. *Polk*: The average yield of corn is 45 bushels to the acre; this at present is worth 40 to 42 cents per bushel, or, say, 41 cents, and we have \$18.45 per acre. Wheat with us averages 9 bushels per acre, \$1 per bushel, equal to \$9 per acre. Oats yield \$16.50 per acre. *Macoupin*: Corn fed to hogs realized 50 cents per bushel, most of our hogs selling at \$5 per hundred. Wheat-crop of 1873 was light, and paid but little over expenses. *Cass*: Raising corn and feeding cattle

and hogs. Stock-cattle sold in November at 4 cents per pound; hogs, $3\frac{1}{2}$ cents per pound; fat cattle are now worth $5\frac{1}{2}$ cents per pound, and fat hogs 5 cents per pound. We feed our cattle on shock-corn, that is, the corn, fodder and all. We keep two hogs to take up the waste or litter of each steer. Thus our stock at the cost price in November, and at the present prices of fat stock, will make us 60 cents per bushel for our corn, which we consider a good price, where one hand can cultivate 40 acres of corn, making 50 bushels to the acre, equal to 2,000 bushels; this, at 60 cents per bushel, would foot up \$1,200, a very profitable return for 40 acres of land, and the labor of one man.

MISSOURI.—*Ralls*: Corn pays a profit from \$12.50 to \$15 per acre; wheat, from \$9 to \$9.90 per acre; and oats from \$9 to \$10.50 per acre. *Dallas*: Notwithstanding the light yield of our corn, still it was the most profitable crop that we had, as the price per bushel has been in advance of the prices obtained for several years past; also where the crop has been used in making pork and the pork packed at home, it promises to pay very well.

KANSAS.—*Linn*: One man can farm 50 acres of corn, which if fed to growing stock nets more money than any other work. *Riley*: Careful accounts for the past five years kept on one farm have shown the wheat account in debt \$80, while the corn shows a profit of \$110. *Cloud*: The raising of corn, which has been sold to feeders at 20 and 25 cents per bushel, and according to their own statements they will realize 60 cents per bushel. *Woodson*: One farmer states that he cribbed 1,100 bushels of corn from 25 acres, for which he has been offered 25 cents per bushel. The cost of an acre he reckons as follows: preparing ground, including plowing, harrowing, and laying out, \$2; planting, 50 cents; cultivating, \$1; picking, \$1.50; total, \$5. The crop averaged about 40 bushels to the acre, and at 40 cents per bushel would be worth \$16 per acre, less the expenses, \$5 per acre, leaving a profit of \$11 per acre.

WHEAT.

The simplicity of the process of cultivating and preparing for market, the comparatively small amount of labor and expense required, a constant cash market, and the quickness of the returns—that is, the short interval between the outgo for seed and labor and the income from sale of the crop—are among the reasons advanced in favor of wheat as a desirable and profitable crop. The drawbacks are that it is a very uncertain crop, and, as it is never fed out on the farm beyond what is needed for family use, it is constantly taking from the soil without any return, and hence, where cultivated as a specialty, there is apt to be a steady decrease in the average yield.

PENNSYLVANIA.—*Lawrence*: I give the result of my experience on 10 acres of clover-rod; plowed under in August, 1872, and on September 14, drilled in with Fultz wheat. Expenses: Plowing, \$30; harrowing twice, \$10; drilling, \$7.50; 10 bushels of seed-wheat, \$20; harvesting and thrashing, \$55; interest on 10 acres, at \$100 per acre, 6 per cent., \$60; total, \$182.50; returns, 230 bushels of wheat, \$1.75 per bushel, \$402.50; profit, \$220. *Lycoming*: The crop was remarkably good. *Lebanon*: Average yield about 20 bushels per acre, which, at \$1.60 per bushel, and the straw \$10, makes \$42 per acre. Some of the best farmers averaged 25 bushels per acre. Corn comes next; best farmers averaged about 50 bushels per acre, which, at 55 cents per bushel, and fodder \$12, equals \$39.50. *Northampton*: My own crop was greatly in excess of that of 1872, in quantity, quality, and weight; every bushel has exceeded in weight the legal standard, and it is so generally in the whole county.

MARYLAND.—*Montgomery*: I put \$500 worth of fertilizers on my crop; had 1,300 bushels, at \$1.80 per bushel, \$2,340, leaving \$1,840 for labor, seed, and profit, and a part of the effect of fertilizers for after crops.

VIRGINIA.—*Northumberland*: When Peruvian or fish guano have been applied, say 200 pounds of the former and 400 of the latter, the yield has been 20 to 30 bushels per acre. *Essex*: The average yield of wheat was about 5 bushels per acre, worth at \$1.60, \$8; straw, \$2; cost of production, \$4.70; net profit per acre, \$5.30. The yield of wheat on improved lands was 15 to 25 bushels per acre. I was at much pains to ascertain the result when a good dressing of barn-yard manure was given, and the yield was never less than 15 bushels per acre. The application of commercial manures did not give the yield that was expected.

NORTH CAROLINA.—*Forsyth*: Price, from \$1.25 to \$2.

TEXAS.—*Basque*: The average of yield of wheat per acre is 20 bushels, and average price \$1.25—\$25. The expenses per acre: 1 bushel of seed, \$1.25; seeding, \$2.25; harvesting and thrashing, \$5.50; total, \$9; net profit, \$16. Wheat is also much better in this region for being pastured, and is worth about \$6 per acre as a winter pasture.

But a few months in the year are required for cultivating and saving it, so that a plenty of time is allowed for other crops, repairing fences, and other farm-work. One acre of cotton will, on the average, yield about 400 pounds of lint after deducting toll at the gin, which, at the average price of 9 cents, gives \$36. Expenses—breaking ground and planting, \$3.50; cultivating, \$4.25; picking, \$15; hauling to gin, bagging, and ties, \$6; hauling to market, at an average of thirty miles, \$3; total, \$31.75; net profit, \$4.25. And but little time can be had for other crops and work on a farm where cotton is the staple.

WEST VIRGINIA.—*Barbour*: The raising of wheat leaves a net profit of \$14.50 per acre. *Mason*: One field of wheat of 180 acres produced an average of 25 bushels per acre, and sold early in the season at \$1.25 per bushel, or \$31.25 per acre. Another crop of 225 acres produced 22 bushels per acre, and sold at \$1.50 per bushel, or \$33. Another field of 90 acres yielded 23 bushels per acre, and sold at \$1.40 per bushel, or \$32.20 per acre. A fourth field of 75 acres gave an average yield of 20 bushels per acre, and sold in October at \$1.50 per bushel.

OHIO.—*Madison*: Average yield of wheat 22 bushels to the acre, and worth \$1.25 per bushel, or \$27.50 per acre. Average value of corn would not amount to \$10 per acre this year.

MICHIGAN.—*Kalamazoo*: The yield per acre of winter-wheat varies from 10 to 25 bushels. The excess over about 15 bushels per acre (an average crop) is usually in the exact ratio of the additional tillage given. I think a uniform yield of 25 or even 30 bushels can be obtained, provided the land is in good heart and thoroughly cultivated. *Washtenaw*: In this county the average of the wheat crop for the last three years would be \$40 per acre each year. *Richland*: Winter-wheat yields in this county from 16 to 30 bushels per acre, and is always worth \$1.25 per bushel.

MINNESOTA.—*Le Sueur*: The average yield of our principal crop, wheat, is 20 bushels to the acre, and the value per acre is \$19. The expenses of raising the same are: plowing, \$2; seed, \$1.80; seeding, \$1; harvesting, \$3.50; for thrashing and marketing, \$3.50—total expenses, \$11.80; profit per acre, \$7.20. *McLeod*: On 22 acres of land 319 bushels of spring-wheat were raised, at a total cost of \$229.60. The 319 bushels sold at 90 cents per bushel, amounting to \$287.10, leaving a profit of \$57.50. *Douglas*: Wheat brings 75 to 80 cents per bushel; average yield per acre, 21 bushels. The yield was considerably reduced last year by bad seed. *Houston*: The average yield of wheat is probably about 18 bushels per acre; the price at the different railroad-stations since December averaged \$1.06 per bushel. I estimate all over 15 bushels per acre as profit. There is no doubt that farmers here devote too much of their attention to wheat-growing for the good of their land, or even present profit. Sheep, corn, clover, and other grasses, with stable-manure and proper rotation, are the means to restore and preserve the fertility of our soil.

IOWA.—*Tama*: Some of our farmers average 15 to 16 bushels of wheat to the acre. Such crops were on new-breaking or fall-plowing, with 50 to 100 acres in wheat, and a market-price of 90 cents to \$1 per bushel. Many of our farmers did well. *Delaware*: The average cost of raising one acre of wheat, and yielding 17½ bushels, is about \$11.45, including seed, seeding, harvesting, thrashing, hauling to market, and interest on the land; the average price per bushel would be about \$1—giving \$17.50; and, after deducting the expenses, leaving a profit of \$6.15 to the farmer. *Boone*: Wheat averaged 20 bushels per acre, and sold at \$1.25 in market, and this is a high estimate for the past season. Oats, barley, &c., have been somewhat less remunerative; whilst corn averaged, say, 55 bushels per acre, and sold in the crib at 55 to 60 cents per bushel. Estimating the corn at 50 cents, we have per acre for corn \$27.50, and per acre for wheat \$25. *Sioux*: Wheat is almost exclusively our principal crop, but was destroyed last year by the grasshoppers.

MISSOURI.—*Pettis*: Wheat-culture decidedly the most profitable. Taking the average of 22 bushels of wheat to the acre, the profits of a ten-acre field would be as follows: Dr.: Drilling, \$3; harrowing, \$4; plowing, at \$2 per acre, \$20; cutting and harvesting, \$20; thrashing, at 10 cents per bushel, \$22; interest on land, \$20; seed, \$24; taxes on land, \$5; total cost, \$118. Cr.: By 220 bushels of wheat, at \$1.15 per bushel, \$253; straw, \$1 per acre, \$10; total receipts, \$263. Less the amount of expenses, \$118, leaves a profit of \$145, or \$14.50 per acre. *Cape Girardeau*: The raising of wheat was the most profitable upon the whole. *Bollinger*: Wheat has been most profitable in the northern section of our county and the most productive in the southern section, and is used principally for feeding to hogs and cattle.

KANSAS.—*Marshall*: Spring-wheat has been most profitable of grains. Until the two past years winter-wheat has been considered most remunerative. Spring-wheat has yielded from 15 to 30 bushels per acre, and has proved a great success. *Jefferson*: Winter-wheat, taken one year with another, has upon the whole proved most successful. *Lyon*: One of my correspondents states that he raised 550 bushels of wheat off 35 acres. This was worth about \$750. *Labette*: At this date wheat is worth \$1.50 per bushel in Saint Louis, and it costs 25 cents per bushel to ship it there, so it takes one-sixth of the whole value to get the crop into market; whereas corn costs about the

same price to ship, and when in Saint Louis brings about 75 cents per bushel, thus costing one-third of the value to ship. Cost of cultivating 966 bushels of wheat on 40 acres of land, \$473; part of the crop, 550 bushels, brought \$1 per bushel, amounting to \$550; and 416 bushels brought \$1.25 per bushel, or \$520; total, \$1,070; leaving a net profit of \$597.

NEBRASKA.—*Otoe*: The exceedingly favorable season having been happily adapted for the growth and maturing of wheat, it has proved our most profitable crop. *Jefferson*: Wheat the principal crop of the county; oats and barley do almost equally well. *Thayer*: The yield of spring-wheat was from 18 to 20 bushels per acre, and is now worth \$1 per bushel. *Antelope*: Spring-wheat has been the most remunerative. *Madison*: Wheat-raising is the only branch there is any profit in; all the other crops were failures.

CALIFORNIA.—*Santa Clara*: This is emphatically a wheat-producing county. *Napa*: Wheat-raising has greatly predominated in Napa County for the past year. It is estimated that the production of this cereal will reach 10,000 tons; this estimate is based upon statistics furnished by warehousemen, middlemen, and from other sources.

OREGON.—*Lane*: There is no doubt that the raising of wheat has been the most profitable both in the aggregate and in individual examples. In fact, some branches, and those not a few, are neglected by our people in order to avail themselves of the immediate results of selling wheat.

UTAH.—*Washington*: Our wheat-crop has been particularly profitable the past season owing to a majority of the farmers having sown in the fall.

NEW MEXICO.—*Taos*: Wheat has proved most profitable during the past year in our farmers' valley.

MONTANA.—*Lewis and Clark*: Wheat, although somewhat damaged by the grasshopper, has proved most profitable of the crops.

DIVERS CROPS.

A considerable proportion of the returns of the Central and Western States indicate no positive preference for particular crops, but express the true idea of successful general agriculture, which embodies a wise selection of a variety of crops in rotation, chosen with reference to soil or market or other modifying circumstance. Many discussed the obvious advantages of general cropping over restriction, more or less exclusive, to a specialty. As this investigation has to do rather with the comparative profit of the various crops comprising the rotation than with the relative profitableness of specialties and general farming, these extracts are mainly confined to such comparisons, for the purpose of showing what branch of the rotation is most prominent at the present time.

RHODE ISLAND.—*Newport*: Farmers living within three or four miles of the city find it most profitable to give most of their efforts to producing milk. Some of them add more or less of market-gardening. A large number, who are too far from the city to carry milk profitably, make most of their profit by selling hay. A third class, whose land is adapted to growing early potatoes, have made this most profitable the past year. The small size of the farms, and the high price of labor, rent, manure, &c., render it almost impossible to make any profit by growing grain, stock, wool, or pork.

CONNECTICUT.—*Hartford*: The paying crops are tobacco and garden-vegetables, and grass and hay turned into milk, sold in the cities and manufacturing villages. On account of the high price of labor few other farm-products pay.

NEW YORK.—*Erie*: Potato raising has been the most profitable, according to the area occupied. The yield has ranged from 100 to 300 bushels per acre, and the price from 70 to 80 cents per bushel. F. R. Davis sold, July 20, from one acre 300 bushels of early rose for \$240. (The ground had been planted with potatoes on the sod the year before and yielded about the same.) Expense of cultivating, including seed and 25 loads of manure, at \$1 per load, \$60. On the 25th of July the acre was sown to turnips. *Warren*: On farms adapted to grass, making butter and cheese; on light soils, corn and potatoes. We have dairymen who report \$60 worth of butter and cheese per cow. I raised \$75 worth of potatoes per acre last season. *Schenectady*: In some sections the hay-crop has been the most profitable. The potato-crop yields the most money per acre of any crop raised the past season. In some sections the white peach blow has netted \$100 per acre. *Otsego*: The staple product of the county, hops, has probably been the most successful with those who, by reason of favorable location, diligence, and care, have secured a good crop—600 to 800 pounds per acre. The price has raised from 25 to 50 cents, according to quality and date of sale. *Oncida*: Hops in the

southern part of the county and dairying in the northern. The town of Sangerfield had about 1,000 acres in hops, the estimated yield of which was 500 pounds per acre. The price per pound in the fall was 40 to 50 cents. But Germany and England, with their cheap labor, have been able to send over large quantities, in consequence of which the price has been reduced to about 25 cents. *Ontario*: Hop-growing, wool-growing, stock-raising, and fruit-producing, each has its ups and downs. *Wayne*: Tobacco paid largely. Among grains, barley paid best. *Genesee*: Wheat, which generally takes the lead, has lost that rank this year in most of the county. Barley, apples, wool, pork, beef, products of the dairy, and eggs, would each have claims for pre-eminence with different farmers. The farmers as a whole will add something to their wealth out of the last year's crops. *Onondaga*: We have a mixed agriculture, perhaps as much so as any county in the State. The dairymen undoubtedly have done better than any other class of farmers, especially those who have raised hops in connection with dairying. The amount cleared from each cow has varied from \$40 to \$70. Much depends on location, and very much on the skill and industry of the manager. Hops have sold for from 35 to 45 cents per pound. One farmer cut about 100 acres of meadow, and sold from it 200 tons of hay at \$17 per ton—\$3,400. An Irish farmer, owning 60 acres, came recently to pay interest due me. He paid, principal and interest, \$500, and has paid to others over \$200—over \$700—all from this year's profits. He raised wheat, barley, oats, corn, and potatoes, besides keeping stock necessary for the farm. *Rensselaer*: The cultivation of potatoes and hay is the most profitable, except fruit, not much of which is raised. *Columbia*: The principal crops were hay and rye. The large number of mills for the manufacture of straw-paper make rye one of the most profitable crops we can raise. Our ready access to market makes the hay-crop also very profitable.

NEW JERSEY.—*Camden*: The branch most followed is gardening upon a pretty large scale, and the success is so various that from a crop of tomatoes one will sell \$250 or \$300 worth per acre, while the crop of another near him will not pay the cost of cultivating and marketing. On small, well-cultivated farms many average in the amount of sales \$100 per acre, and on large ones scarcely more than half of that. Dairy-farming is receiving considerable attention. The best results are shown in the more rapid improvement of the farms devoted to it, owing to the increased size of the manure heap. The average sales on these farms will not exceed \$50 per acre, leaving the net proceeds at about \$10 per acre, exclusive of the manure. *Cumberland*: Farming more diversified probably than in any other county in the State. In some portions a great deal of attention is paid to the raising of "truck" for the Philadelphia and New York markets, and where the soil is adapted I think this is the most profitable branch of farming. Some pay considerable attention, not to the raising, but to the fattening of stock, others mixed-husbandry.

PENNSYLVANIA.—*Bucks*: Within twenty miles of Philadelphia, the growing of grass for hay. A farmer, who combines intelligence with industry and energy, has, the past year, marketed \$1,204.66 worth of hay from a farm of 95 acres, besides keeping a stock of 25 to 30 head horses and cattle. His sales of hay for four years have averaged 42 tons, and in value \$1,157. He states that his farm, valued at \$150 per acre, has yielded him over 10 per cent., after deducting interest on land, stock, and all expenses. More remote from the city the dairy becomes the chief source of profit. For a 100-acre farm, 15 cows are a fair stock, and the average profit per cow ranges from \$50 to \$60. In this case the hay and grain are mostly consumed on the farm, and the way is opened for fattening market and winter pork, which is for the most part remunerative. In the absence of the dairy the growing of early lambs for market shows a fair profit. The account of a neighbor who, in the fall of 1872, bought 50 ewes, stands thus: for the 50 ewes, \$4.50 per head, \$225; for a Southdown buck, \$15. Received for 51 lambs, \$306; 150 pounds of wool, \$75; 45 ewes in the fall, (5 having been lost,) \$225; value of the buck on hand, \$16; showing a profit of \$382. This can be relied on if the lambs can be got into the market early. In cost of keeping, 6 ewes are considered equal to 1 cow. This branch of farming requires less labor than a dairy. The chief drawback is danger from dogs. Potatoes and fruit are next in profit. The cultivation of the latter, except apples, is limited, but of the former is becoming general. *Butler*: Within the last two years developments have proved this county to be the largest and best oil-district in the world; consequently towns and improvements have sprung up as if by magic, scattering millions of dollars among land-owners. This has caused an unprecedented demand, at high prices, for every article the farm can produce for man or beast. *Mercer*: Cattle, cheese, and butter—our iron-manufactories and oil-producing regions near by make a cash demand for the above. *Franklin*: Wheat and corn. These are the staple products, and the evidence that they are profitable is the certain prosperity of our farmers. *Luzerne*: The population of the county is estimated at 200,000, about three-fourths of whom are engaged in mining and shipping coal, or business connected therewith; consequently farm products of every kind find a ready market at good prices, and the result is that farmers are more disposed to raise a variety of products than to adhere to a few. While the great west fills our market with grain to repletion, truck has no competition. *Washington*: If it were not for depriving the farm of manure by selling its pro-

ducts instead of feeding them, raising hay and grain for sale would seem to have been the most profitable the past year; indeed for several years past. But we shrink from this method because we think a man in pursuing it would be just hauling his farm off to the city. *Dauphin*: Trucking, in connection with general farming, has perhaps, on the whole, been the most profitable with us. *Elk*: By the majority hay for sale would be said to be the most profitable. Latterly butter-making has paid about as well. Among the minor crops potatoes are the most remunerative. The high price of labor renders all other plowed crops unprofitable, except what can be raised without hired labor.

MARYLAND.—*Cecil*: Growing cereals is the principal business of agriculture in this county; a few combine with this grazing and dairying. These are considered more profitable.

VIRGINIA.—*Botetourt*: Find it profitable to grow wheat, corn, tobacco, grass, oats, and a good stock of cattle. Wheat, tobacco, and corn are our great money-crops. *Page*: On the 8th and 9th of April I sowed, broadcast, 4 bushels of Excelsior oats on $3\frac{1}{2}$ acres, from which I thrashed 180 bushels, weighing 49 pounds per bushel. At the same time, and in the same field, I sowed 5 bushels of Norway oats, from which I thrashed 230 bushels, weighing 33 pounds per bushel. *King and Queen*: Wheat and oats. The wheat-crop was not a large yield, 6 to 8 bushels per acre, but the price, \$1.50 to \$1.75, made it a profitable crop. The oat-crop was more marked in its results, making 2 tons to the acre, and selling to the lumber-men in our county at \$1.25 to \$1.30 per 100 pounds. *Westmoreland*: The chief crops are corn, wheat, and oats, with a little of stock-growing, fruit, truck, and some few try tobacco.

NORTH CAROLINA.—*Yancey*: Corn and wheat. *Warren*: Cotton and tobacco are the only crops made for sale. *Bertie*: Mixed farming was without question the only profitable mode of agriculture. Cotton is the only crop here that commands ready money, and the farmer who produces his provisions for his farm and then as much cotton as his lands and labor will permit, is the only successful worker of the lands. *Franklin*: Cotton can be profitably cultivated here if farmers raise their own supplies. Mr. Henry Pearn made last year 40 bags, 430 pounds each, on 23 acres of land; and 176 barrels of corn on 32 acres. His profits were largely in excess of his outlay. Most farmers, however, cultivate cotton to the exclusion of everything else, and the result is that it takes the proceeds of their cotton to buy supplies. *Gaston*: The cereals and cotton the important products, and unquestionably the most profitable, where the economy of the farmer is directed to the production of all supplies the land will produce; cotton takes less from the land than the cereals, is most easily marketed, and most profitable for market. *Robeson*: Ours are mixed crops, though not so much so as they should be. *Mecklenburg*: Farmers who cultivate corn, wheat, oats, rye, and cotton have made the most money.

SOUTH CAROLINA.—*York*: One acre of our best uplands, well fertilized, will yield one bale of cotton, worth, at 15 cents, \$37.50. After deducting cost of production, including labor, \$22.50; horse-power, \$10; implements and manures, \$10; preparing for market, \$6; seed, &c., \$4; total, \$52.50; the planter receives, net, about \$15 per acre from his best lands. The same acre of land, planted in Irish potatoes in February or March, with careful culture, will produce 200 to 350 bushels. Taking the lowest estimate, 200, the proceeds are worth at the lowest rates, \$150. Manure, labor, harvesting, and marketing (in bulk) can be effected at a cost not exceeding \$75, leaving a net profit of \$75 per acre. In the same way I might satisfy any one familiar with the climate and locality of the larger profit in the production of cabbages, onions, fruits, &c. The result of inquiry leads directly to the answer that the largest profits are obtained from diversified agricultural industry. *Union*: Whenever our best farmers plant altogether cotton, the profits are not so great as when a farmer of the same ability plants mixed crops. Many planted almost entirely cotton. Sales brought 9 to 14 cents. Our intelligent farmers are wakening up to the necessity of improving the land and considering that a part of the year's profit. When they do that, and get some of our old fields, now worth \$4 to \$10 per acre, to be worth \$50 per acre, then our people will begin to open their eyes to their best interests.

GEORGIA.—*Johnson*: We are small farmers and try to make our own bread, pork, potatoes, sugar, and sirup, and after this, produce as much cotton as we can for market. We sell some wool, pork, beef, and poultry, but in quantities scarcely worth mentioning. *Meriwether*: Those planters have done best and made most clear money who have raised provisions at home and only made cotton their surplus crop. They, almost without exception, have done well. *Pike*: Grain and grasses. The few who have clover in cultivation realized a good income from it. The yield was as high as 2 tons per acre at the first cutting, and it was worth as much per acre afterward for grazing cattle and hogs. On three acres of clover and orchard-grass, I grazed last season 20 hogs from the 10th of March to the 15th of August, not feeding them more than 5 bushels of corn. During the same time I grazed three milch-cows, but exclusively at night. All these failed to keep down the clover till warm weather set in. The 3 acres were worth to me at least \$125, and full as much the year before. Besides, my land is

thoroughly enriched by the clover and pasturage, as one would say by looking at the wheat in it now. I put no manure on except 40 bushels per acre of cotton-seed when seeded in the spring of 1871. *Marion*: The farmers have managed badly; planted mostly cotton to the exclusion of corn and small grain. The past season has taught them a lesson by which they ought to be governed in future. *Schley*: Tropical cane, sirup-making, sweet-potatoes. One mule or horse and two hands will make more clear money upon half the acres planted to sugar-cane, sweet-potatoes, (the best of all crops), and the small grains, than can be made with whole acres in cotton. *Liberty*: West India sugar-cane and sweet-potatoes. From 8 to 14 barrels of sugar per acre have been made. Valuing one barrel at \$30, the products of one acre would amount to from \$240 to \$420. The yield of sweet-potatoes successfully cultivated is from 300 to 500 bushels per acre, and the value per bushel from 50 cents to \$1; averaging, if we have 400 bushels, at 75 cents, \$300. The yield of corn is about 10 bushels per acre, at \$1, \$10; of cotton, about 100 pounds of lint-cotton, at 15 cents, \$15; of rice, about 20 bushels, at \$1.25, \$25. *Harris*: No branch has been very profitable, but where they have all been combined more profits and benefits have been realized, and especially where about one-third has been planted in cotton and the other two-thirds in corn, wheat, oats, potatoes, barley, &c. *Catoosa*: In my personal experience last year, 2 acres in clover and timothy mixed yielded about 11,200 pounds of hay, worth at our village \$1 per 100 pounds. No manuring whatever was applied.

FLORIDA.—*Gadsden*: Cuba tobacco and the Scuppernong grape. With respect to the latter, I am informed by a reliable producer, who has been the pioneer in this branch in this county, and who now has a vineyard in full bearing, that 1,500 to 2,000 gallons of wine to the acre is not an extraordinary estimate, where the vineyard has been favorably located and properly cultivated. A person recently from Georgia has established, within the past year, a vineyard of 140 acres, with the design of extending it to still larger proportions. *Orange*: Corn is reported as the most profitable in the southern section of the county. In other sections orange-culture is acknowledged to be the most profitable. My sub-correspondent reports that he has realized a little over \$1,000 clear from the orange-crop of one acre, and not a full crop at that.

ALABAMA.—*Walker*: The corn and cotton crops are nearly equal in value. *Greene*: There is no doubt that the cotton-crop is the most profitable one that can be raised here, if raised as a *surplus crop*. As long as we draw our corn and meal from the West it is impossible that the country prosper, and at the present price of cotton it is simply ruinous. *Bullock*: The cereal or provision crops. The majority of farmers followed in the old ruts, trying to retrieve their broken-down fortunes by planting too much cotton to the neglect of the provision-crops.

MISSISSIPPI.—*Hinds*: Fruit-culture and hay. H. O. Dixon harvested three tons of hay to the acre and sold it in Jackson for \$30 per ton; he cultivates clover, timothy, and orchard-grass; many are planting the grasses this year. *Newton*: Cotton and sugar-cane. We always plant cotton, not specially on account of the money there is in it, but because it will always command the money. With Louisiana sugar-cane, some of our farmers have made 250 gallons of fine sirup to the acre, readily disposing of it at 80 cents to \$1 per gallon. The land that produced the 250 gallons would not have made \$25 if planted in cotton. All who can get seed will plant the cane this season.

TEXAS.—*Red River*: While we claim to be a cotton country, wheat and oats succeeded with us better than any other crops, because they matured before the season could injure them. *Nararro*: Grain-growing; evinced by a general appearance of thrift around farmers who have been engaged in growing grain over and above those who have devoted their entire time to producing cotton. *Titus*: Heretofore the cotton-crop, with prices ruling from 15 to 18 cents, has been most profitable; but now prices are down to 10 to 13 cents, with a poor and unsettled labor system, consequently farmers cannot afford to risk increased acreage; the result was a general resolve to grow grain and stock, making cotton a surplus, and the season just closing finds them with a surplus of grain, with plenty of pork of their own raising, and abundance of hay and roots for wintering their stock. *Smith*: Of the two general crops, corn and cotton, corn has paid the best; all provision-crops have paid better, and always do pay better, than cotton; wheat, though grown in a small way, has been the most profitable crop; a field of 12 or 15 acres yielded 23 bushels per acre, and the wheat was sold at \$2 per bushel, in specie. *Wood*: The small grains. All surplus grains have found a ready sale at good prices, while it cost but a small per cent. of these prices to raise them.

ARKANSAS.—*Franklin*: The cereals have yielded the largest per cent. of profits, although this branch has been much neglected for cotton, which, from the high price of labor, has resulted in a loss to the cultivator. Labor the past year cost the farmer, besides board, \$15 to \$20 per month. I will put it at \$18, and the aggregate expenscs of cotton-crop for one hand foots up \$182.04. The average product per hand, after deducting toll for ginning, will be 1,725 pounds of lint, yielding at 12 cents \$207.36; net profit, \$25 32. The aggregate expenses of a corn-crop for one hand, \$120; product, (at an average of twenty acres, twenty-five bushels per acre,) five hundred bushels at 75

cents, \$375; net profit \$255. In the foregoing estimates no allowance is made for rent of land or wear and tear of machinery. *Scott*: Corn, wheat, oats, potatoes, cotton, and sorghum are grown. Cotton-planting is decreasing, and grain, fruit-growing, and stock-raising are on the increase. The amount of wheat sown last year is doubled this year. *Independence*: The farmers in the county engaged in the production of diversified crops, as wheat, corn, oats, cotton, with pork and beef, are among the most thrifty and prosperous in the United States, while those devoting all their labor and capital to the production of cotton are embarrassed with debt, harrassed with unpaid laborers, and their houses and farms are untidy and without those tasteful adornments which go so far to make rural employment attractive. *Hempstead*: The production of home-supplies has been less unprofitable than anything else. *Marion*: One of my neighbors has a farm of about fifty-five acres; he planted eighteen acres in cotton and the remainder in corn and oats. His wheat was so poor that he plowed it up and planted the land in corn. He raised an abundance of corn to supply him for the year, and about 19,000 pounds of seed-cotton. He has three boys able to do farm-work, and two girls, (and girls are generally good cotton-pickers.) He therefore picked out all his cotton without hiring, which he sold at gin at \$1.75 per 100 pounds, yielding \$332.50, and he has left a surplus of some \$200 in cash, besides a sufficiency of corn and meat for the ensuing season.

TENNESSEE.—*Smith*: Those farmers among us who have diversified their products have been doing best for the past few years. Tobacco-growing brings more money than any other branch, but that it has been most profitable, taking in account the wear and tear and exhaustion of soil, I think hardly any one at all informed believes.

MINNESOTA.—*Sherburne*: A profitable season. One farmer sold, without decreasing his stock, as follows: Cattle to the amount of \$370; cheese, \$255; butter, \$250; wheat, \$150; corn, (22 acres,) 1,100 bushels, at 60 cents per bushel, \$660; pork, \$70; potatoes, &c., \$100; total amount sold, \$1,855. *Blue Earth*: We have an average yield of 40 bushels of oats per acre, with an average price through the month of February of 45 cents per bushel, which gives us \$18 per acre, against 15 bushels of wheat per acre, at an average price of 97 cents, giving us \$14.55 per acre. My own personal experience was $1\frac{1}{4}$ tons of flax per acre, at \$12 per ton; total \$15; 57 bushels of oats per acre, at 42 cents per bushel; total, \$23.94; 15 bushels of wheat at 90 cents per bushel, \$13.94. The cost of harvesting and marketing these crops will not differ materially.

IOWA.—*Calhoun*: The cost of raising 224 bushels of wheat on 22 acres of land, including plowing, seeding, cutting, shocking, stacking, thrashing, &c., amounted to \$144.40; the 224 bushels sold at an average price of 80 cents per bushel, amounting to \$179.20, deduct amount of costs, \$144.40, and a balance of \$34.80 remains for a profit. On 22 acres of land 660 bushels of corn, at an average of 30 bushels to the acre; the total expenses for harrowing, cultivating, husking, cribbing, &c., amounted to \$130.25; the product sold at 40 cents per bushel, amounting to \$264, giving a profit of \$133.75. Three hundred bushels of oats were raised on 10 acres of land, at an average of 30 bushels to the acre; the total expenses amounted to \$31; the crop brought 30 cents per bushel, netting \$90, showing a balance of \$29 in favor of the farmer. *Laylor*: Corn marketed in beef and pork yields from 35 to 55 cents per bushel, whereas the grain itself brings in our market but from 10 to 35 cents per bushel. Beef-cattle are worth from \$4.75 to \$5 per hundred weight, and hogs from \$4 to \$4.75 per hundred weight, at present time. *Marion*: The wheat-crop has been worth \$13 per acre; sorghum, \$18.75 per acre; potatoes, \$25 per acre; corn, \$12 per acre; oats worth \$10, and rye \$9.75 per acre. I mean, of course, that the profits of the crops were worth the specified amounts. *Des Moines*: The growing of corn, and feeding of the same to cattle and hogs, is the most profitable, not only in this county, but in all this region of country. Twenty-five bushels of corn will ordinarily grow a 300-pound hog, which will not cost over a dollar to ship to Chicago; whereas it costs \$3.25 to ship the 25 bushels of corn to Chicago, and the hauling of it to the station. *Jasper*: Raising corn and feeding same to stock; the average yield is about 35 bushels per acre, the majority of fields yielding 40 bushels to the acre; market price about 35 cents per bushel. Mr. C. H. Parker fed during the winter 33 head; averaged 1,250 pounds when commenced feeding, two years old past; has 80 head of hogs following, the hogs averaging 100 pounds in feed lot; cattle cost 4 cents per pound in lot; hogs 4 cents per pound; the cattle sold to deliver at 6 cents per pound, and hogs 4 cents per pound; now, the account stands thus: cattle have increased in weight 350 pounds each, hogs 150 pounds each; by feeding 100 bushels of corn to the steer, value of steer is increased in weight \$96; original cost, \$50; 24 hogs to a steer, gain 150 pounds each at 4 cents per pound, foot up \$15, plus the \$46 profit on a single steer, gives a total net profit of \$61 on feeding of 100 bushels of corn. *Johnson*: One instance of an acre of timothy for seed yielding the owner \$22 profits. The wheat-crop comes next in order, yielding 12 bushels to the acre, and selling at \$1 per bushel; oats yield about 40 bushels to the acre, and sell for 30 cents per bushel. *Grundy*: Almost exclusively wheat and corn; we are following the old rules, traveling in the old ruts, no improvements; the people are poor, and no opportunities to experiment. We are wearing out our lands

by constant cropping, and making the farmers poorer each year, except in the natural advance in the price of land. There were 1,000,000 bushels of wheat raised in this county last year, and now they are out of seed-wheat for the next year, and no money to buy with.

MISSOURI.—*Iron*: Grass and wheat. *Caldwell*: Corn and stock. *Greene*: To some, wheat; to others, tobacco, corn, wool-growing; depending on culture, time of sale of products, &c. For instance, one class of men put in their wheat in a poor, shiftless manner late in the season, and, as a result, harvested about five bushels per acre, and sold at from 75 cents to 80 cents per bushel. Another class in the same neighborhood, soil, &c., put their wheat in thoroughly, with deep plowing, so that the drought did not affect them, and, as a result, harvested from twenty to twenty-five bushels per acre, and not being satisfied with the price early in the season, and being thrifty farmers and able to hold their produce, are now selling their wheat at from \$1.20 to \$1.30 per bushel. The same holds good as to corn. One person to whom I sold 80 acres last spring, at \$15 per acre, put in his sod-crop so thoroughly that his first crop will sell for enough to pay for the whole tract. *Harrison*: The raising of hogs and corn. There has been from 20,000 to 25,000 hogs sent from this county, at from \$3 to \$4.25 per hundred. The corn sold has brought from 20 cents to 35 cents per bushel. *Ray*: The raising of corn and grass, and feeding the same to cattle and hogs for market. In some localities tobacco has proved very remunerative. Wheat raised principally for home consumption. *Bates*: Grain-growing and stock-raising. Mr. J. L. Henry, from a capital of \$4,000 invested in cattle, realized in one year a net profit of \$1,875, and this is not an isolated case. *Mercer*: Corn, grass, and wheat are about equally productive, but, upon the whole, wheat has paid the best. *Ripley*: Cotton in southern and corn in northern part of the county. Cotton yields from 1,000 to 1,200 pounds to the acre, while the product of corn is from 25 to 50 bushels per acre, and is worth from 25 to 50 cents per bushel. The yield of wheat is from 10 to 15 bushels per acre, and sells from 80 cents to \$1 per acre; but for want of transportation and mills none is grown except for home consumption. *Winnebago*: Butter, cheese, and wheat have paid the best; feeding of first-class cattle and sheep has been profitable also. I shipped one car-load of sheep only, of 64 head, weighing 137 pounds each; netted 6 cents per pound at home, amounting to \$8.22 each. From 50 acres of wheat, \$600, or \$12 per acre.

CALIFORNIA.—*Mendocino*: Sheep and hops. Sheep-raising has been the leading business of profit for the year 1873. On the 1st of April, 1873, there were 167,000 sheep, old and young, in this county; these were valued by the assessor at \$422,186. As an investment in this business we must add the cost of range, not less than 80 per cent. of the value of the sheep, making in all \$1,000,000 invested in the sheep and wool business of this county. I learn from B. F. Forsythe that on the first of January, 1873, he had \$6,000 invested in this business; during the year he sold wool to the amount of \$1,500; wethers, \$800; increase of stock, \$1,000; expenses of herding, shearing, taxes, &c., \$1,000; and which amount deducted from the receipts leaves \$2,300 profit on an investment of \$6,000. I believe this is about an average of the profits, even where the business is carried on more extensively. In short, the profits may be always set down safely at 30 per cent. The climate of this county is also peculiarly adapted to the production of hops; the total cost of raising one acre of hops amounts to \$181; the yield will average 1,200 pounds, at 35 cents per pound, \$420; net profit, \$239. *Alameda*: Wheat, fruit-drying, and beet-sugar. I have been informed there were fields of wheat, of from 50 to 100 acres, that yielded 40, some 50, and others even 60 bushels to the acre; these of course were rare instances, the exceptions. There is a large fruit-drying establishment in operation here, likewise an extensive beet-sugar manufactory. *Contra Costa*: Grain-farming, wheat and barley. The yield was better than expected, and prices realized were higher by $\frac{1}{2}$ to $\frac{3}{4}$ per cent. per pound on former years.

OREGON.—*Union*: Wheat has this year paid a greater profit than any other product. Stock-growing, however, is the chief employment and the greatest source of profit.

NEVADA.—*Esmeralda*: Wheat, barley, and hay. The soil is very rich and deep, not having been long enough worked to require manure for fertilizing.

UTAH.—*Morgan*: Wheat, oats, barley, and potatoes. We found an excellent market in California for our wheat. Barley sold from 85 cents to \$1 per bushel.

NEW MEXICO.—*Doña Ana*: Wheat has produced the most of any crop in this valley. The grain is remarkably heavy, reaching from 60 to 65 pounds to the bushel. The Mexican farmers do not sow more than 45 pounds of seed to the acre, and under their unscientific method the yield is from 15 to 40 to one. Sheep and cattle are reared under the care of herders, and the business is the most profitable of any.

DAIRY HUSBANDRY.

MAINE.—*Penobscot*: Especially commends itself to farmers at a distance from market. *Franklin*: Especially cheese-making. More cheese-factories to be erected this spring, and to the satisfaction of those who supply milk.

VERMONT.—*Addison*: Butter and cheese. A few have realized much the largest profit in raising Spanish or American Merino sheep. *Franklin*: C. S. McAllister, of Enosburgh, made the past season, from 60 cows, about 150 pounds of butter per cow, and sold it at prices averaging for the season 34 cents per pound, making a gross income of \$51 per cow. Am not informed of the cost of packages, salt, and other expenses. W. H. McAllister, of the same town, reports an income of \$2,000 from 40 cows, besides milk, cream, and butter for a family of twelve. *Washington*: One farmer, from 17 cows, sold the past year 3,078 pounds of butter for \$1,050, besides supplying his family with milk and butter, and selling several calves for veal, making the income \$68 to \$70 per cow. The same farmer had 20 ewe sheep; grade, Southdowns; the wool and lambs from which sold for \$130. It cost as much to keep these sheep and lambs as three cows, which would have afforded \$200. *Rutland*: Since the opening of the Pacific Railroad we have not been able to compete with western wool-growers. The last year's sales of wool reached only about 40 cents per pound, while our dairies have paid from \$45 to \$75 per cow. *Caledonia*: One farmer made 3,000 pounds of butter from 15 cows, which sold at home for \$1,000. Good, early-cut hay will pay \$20 per ton if fed judiciously to good dairy cows; one hundred Merino ewes will average 85 lambs, worth \$3 per head, and 600 pounds of wool, worth 48 cents per pound; making \$543, or \$5.43 per head. This has been done by one of our farmers for the last five years.

MASSACHUSETTS.—*Middlesex*: Raising milk for the Boston market. Market-gardening and raising field-crops for market are branches gradually extending.

CONNECTICUT.—*Litchfield*: Making butter and cheese and selling milk.

NEW YORK.—*Delaware*: In this county no branch compares in profit with butter-making. At the meeting of our agricultural society in January last, statements, attested by oath, were presented by two competitors for premiums on the largest quantity of butter per cow made the past season. These were 228 pounds and 232. In the one dairy there were under and in the other over eight cows. *Chemung*: Most profitable and most certain of prompt cash returns. One dairy of 12 cows yielded \$82 per cow from April 1 to December 1. In well-managed dairies a fair average has been \$50 to \$60 per cow. *Dutchess*: Sending milk to New York. Where cows are kept the large amount of manure returned to the soil improves it continually, whereas the selling of hay robs the land. *Chautauqua*: The manufacture of cheese by the co-operative system of cheese-factories has proved the most successful branch of farming in this country. Several dairies have yielded a net income of \$55 to \$63 per cow. The growing of potatoes was very successful, and netted a much better profit than any grain. *Allegany*: The yield per cow of milk sold at the factories ranges from \$32 to \$60, while the calves and the milk, earlier and later than the factory season, will about pay for pasturage. Western corn, ground and fed with hay and straw, has been largely used for feed through the winter. *Steuben*: A good dairy will net \$50 per cow in butter, as that sold through the season for not less than 30 cents per pound, and at present 50 cents is paid for a prime quality. Buttermilk is estimated to be worth 4 cents per quart for feeding pigs or moistening feed for the cows. *Tioga*: Statistics show that butter-making has been the most profitable; 20 cows made 3,200 pounds of butter, which sold at 40 cents. *Jefferson*: A neighbor who carried on a farm on shares, says: Of the 190 acres in the farm, 30 are woodland; of the remaining 152 acres, 40 were cultivated in grain, corn, and potatoes; 40 were in meadows, and 72 in pastures. From 19 cows kept, butter and cheese were sold to the amount of \$765; value of milk, butter, and cheese used by two families, \$200; expenses for labor, &c., on the farm, \$400, two-thirds of which, \$266, should be charged to the dairy. This being deducted leaves a profit of \$6.24 per acre for the 112 acres in meadow and pasture. The grains, corn, and potatoes produced on the 40 acres were worth in the aggregate \$300. Deducting \$133, one-third of the expenses, leaves only \$4.17 per acre. Furthermore, credit should be given for the increase of stock, as, besides the cows, a dozen calves and young heifers and three colts were pastured and fed with hay; also the comparative effect on the land, which is more exhausted by raising grain. *Cattaraugus*: J. J. Humason milked last season 115 cows. He practiced feeding of the skimmed milk to the cows during the entire season, from March to January. He made 20,830 pounds of butter; average per cow, 181 pounds; average price, 32 cents per pound; average value per cow, \$57.92. This can be much improved upon by a closer selection of cows adapted to the butter-dairy. Smaller dairies yield larger products per cow.

NEW JERSEY.—*Sussex*: The cows are mostly ordinary or native. Farmers in the milk business here find it more profitable to buy than to raise their cows. One, from 13 cows, sold, the past season, milk to the value of \$960, averaging about \$74 to the cow, besides supplying the family with milk. Many of our farmers are not convenient to railways or creameries, and are, therefore, engaged in making butter and pork. At this they have done very well. Still, the milk business brings in quicker returns, involves much less labor, requires less hired help, and is, therefore, more profitable when the dairyman is convenient to the cheese-factory or railroad.

PENNSYLVANIA.—*Erie*: The manufacture of cheese by factories, taking the produce of a large number of farmers together, has produced results of economy and profit.

Tioga: First, because it can be carried on with less labor; second, because of the uniform high prices of butter and cheese, while all other farm products fluctuate; third, it improves the farm more than grain-growing. I give the statistics of my own dairy of only 9 cows: Value of the cows, \$450; interest for one year, \$27; pasturing, \$108; wintering, (including 1,350 pounds of meal fed,) \$168.61; cost of making 1,450 pounds of butter, 3 cents per pound, \$43.50; total, \$797.11. Returns: 1,450 pounds of butter, 34 cents per pound, \$493; 9 veals, \$72; 900 pounds of pork, 7 cents per pound, \$63; value of the cows on hand, \$450; total, \$1,078; net profit, \$280.89. The above is a fair average for the county; some large dairies do better. The butter, sold some time ago, is now worth 40 cents, which would add \$57 to the profits. No other branch will pay as well for the amount invested. *Montgomery*: Farmers living on the railroads, which traverse our county in almost all sections, generally prefer selling their milk, as that requires far less labor in preparing for market than butter. Labor is becoming a great consideration with us, not only on account of difficulty in procuring it, but of the high price it commands. *Chester*: A dairyman reports that on a farm of 140 acres he keeps 30 cows, which yielded 6,566 pounds of butter, sold at 43 $\frac{3}{4}$ cents net, or 218 $\frac{3}{4}$ pounds, and \$95.70, per cow. *Philadelphia*: The milk business, and next to this the more bulky crops which cost too much to bring from long distances.

MARYLAND.—*Carroll*: I keep 16 cows, from which I sell 25 gallons of milk daily the year round, at 18 cents net per gallon; making \$1,642.50 in addition to the use of milk and butter in a family of twelve. Previous to the opening of the Western Maryland Railroad, no milk reached Baltimore from this county; now we are sending 800 to 1,000 gallons daily. We probably make 1,000,000 pounds of butter per annum. Within eight years the dairy business has increased 20 per cent.

MICHIGAN.—*Oakland*: During the month of April we milked and made from 5 Durham cows 160 pounds of butter, which brought 35 cents per pound, making \$56; and, after deducting the express-charges to Detroit, which were \$1.60, leaving \$54.40 for one month's income from 5 cows. During the year 8 Durham cows made 1,312 pounds of butter. The average price for the same was 23 cents per pound, making \$367.36, or \$45.92 per cow; add to this the price of 5 calves, sold for \$12.50 per head, (and the rest would have brought the same if sold,) and you can see that the income annually from each cow is \$58.42. *Wayne*: Dairying has been decidedly the most profitable branch of industry in this county. Several instances have occurred where parties have run in debt for an additional farm, and in a few years have paid up everything. In one instance a neighbor purchased a farm, running in debt \$10,000, and in less than five years paid up for it.

WISCONSIN.—*Green*: There are over twenty cheese-factories in this county, of sixteen towns. A number of them make the common American cheese, but several are engaged in the manufacture of the variety known as Limburger. *Sheboygan*: During the past year the manufacture of cheese in our county amounted to 1,000,000 pounds, having 2,888 cows for its source. A considerable amount has also been made by the small manufactories.

IOWA.—*Muscatine*: One of my correspondents, giving his experience in dairying, expresses his preference for butter-making. He says: "I have milked 20 cows during the past season; average value of cows last spring, \$20 each; raised 20 calves, averaging \$8 for each; sold \$300 worth of butter, besides supplying my own table. Pasturage for the cows cost about \$60. The milk fed to pigs has more than paid all other expenses and the labor bestowed upon them."

STOCK-RAISING.

MAINE.—*Oxford*: Almost the only source of profit to the farmer. The local markets afford a demand for all the beef and early lambs he can supply. *Piscataquis*: Sheep more easily kept and yield more profit on the capital invested than neat stock.

NEW HAMPSHIRE.—*Carroll*: Cows as high \$50 per head. Sheep that could have been bought last spring for \$2 per head are selling for \$4 and \$5, to say nothing of the wool-clip, which sold for 40 cents per pound. Horses high, also working-oxen. A pair bought last spring for \$90 can now be sold for \$130. *Cheshire*: Where suitable pastures can be procured. One farmer on a river-farm of 40 acres, with a hill sheep-pasture of 50 to 60 acres, (costing not over \$10 per acre,) keeps 150 Spanish merino sheep, 3 cows, and 2 horses. Last year, besides keeping his flock good, he sold of wool and increase to the amount of \$500, and that is about his annual income. Raising young cattle comes next in profit, requiring but little outlay and little assistance where labor is so high that it eats out all the profit.

PENNSYLVANIA.—*Westmoreland*: Perhaps the breeding and rearing of horses might claim pre-eminence, especially since the importation of the large English Lincoln horses. These are now extensively bred, and sell readily at prices, for the best specimens, ranging from \$500 up to \$3,000. The French "Percherons" are also making their way among our farmers, but are not yet so popular as the others.

MARYLAND.—*Kent*: Sheep and hay.

VIRGINIA.—*Floyd*: The raising of horses, cattle, sheep, and hogs; our grain, hay, &c., being consumed at home, as we are too far from the railroad to ship them. The animals we raise, when in good condition, always sell for cash at remunerative prices, while the grain and hay do not. *Prince William*: The growing of steers; but not so much so as in the past five years; 25 to 50 per cent. has been realized on the purchase-price. *Grayson*: Grazing cattle. *Smyth*: The principal business of the farmers of this county. *Highland*: And has been almost from the first settlement of our isolated county. A great abundance of horses, cattle, and sheep are sold annually from the county. *Stafford*: In flocks of about 50 head. One farmer has realized annually \$3 per head for three years. Next to sheep, stock-raising.

NORTH CAROLINA.—*Cherokee*: Covers all, or nearly all, the profit in the county. *Ashe, Jackson*: Beef-cattle. They are pastured on the mountain-commons for six or seven months, are very fat in the fall, and bring cash at Charleston.

GEORGIA.—*Gilmer*: The raising of beef-cattle. The mountain-range furnishes free pasturage in summer; and our county, being an elevated, mountainous region, is entirely free from Spanish fever, or any infectious disease of cattle. This business is taking the lead, owing to our great inconvenience from market for other products.

IOWA.—Stock-raising and feeding. Three years ago I bought five common steer-calves for \$35. I kept them about eighteen months, at a cost of not more than \$35 more, making the total cost \$70. I sold them off the range for \$145, netting \$75 profit. *Appanoose*: Cattle are a great source of revenue; steers fed six months generally take on 300 pounds gross, and, in addition, sell for 2 cents per pound gross more than they cost in the fall; and each steer feeds 2 hogs, which will take on 150 to 200 pounds each during that time.

MISSOURI.—*De Kalb*: Raising stock is the best business, and has proved most remunerative to the farmer, from the fact the pasture costs nothing and they are wintered in the stalk-fields with some hay and a very little grain. *Saint Clair*: Stock-raising, decidedly. To own a farm here and not raise stock would be a poor investment indeed. During the past year I sheared 29 head of sheep, of a very common and inferior stock, mostly old ewes. I sold \$25 worth of wool, made 15 yards linsey, have plenty of stocking-yarn on hand, and raised 17 lambs. *Nodaway*: Stock-growing has paid at least 70 per cent., and has brought \$800,000 into the county. *Stoddard*: Calves are plenty each fall for \$2 per head; \$1 worth of corn-meal will winter each, with the feed in the range; at one and one-half years old they will sell at \$5 or \$6 per head; at two and one-half years old they will bring from \$10 to \$12 each, and the actual cost of each not over \$4 or \$5.

KANSAS.—*Brown*: Stock-raising and feeding cattle and hogs. The price of corn was very low up to about September; at present it is worth four times as much as a year ago. *Ellsworth*: Stock-raising as a general thing, and it will usually pay 30 per cent. upon the investment. *Nemaha*: Raising stock. Fattening cattle for the Eastern markets in spring is a very profitable business, but it has been pursued mostly by middlemen, speculators, and millers. The non-producer invests his capital in some tens or hundreds of steers; also for corn and hay; hires his help for a mere pittance, and plays the gentleman himself, and more than doubles his money in five or six months, and in many cases pays no taxes, but migrates from place to place between the time of assessment and collection; and the same producer of those products suffering for want of means to prosecute his business successfully and to improve this wild country. *Doniphan*: Stock-raising and stock-feeding has been the most profitable branch of agriculture, although wheat and barley, owing to good prices, have proved quite profitable during the last season. But the profits and losses of agriculture depend more upon the individual than anything else. *Butler*: Stock-raising. Some would buy two-year-old steers for \$12, and in six months sell them for \$25, and often for more. *Republic*: The most reliable branch is the raising of stock. *Nemaha*: Feeding stock, especially cattle and hogs. The cost of feeding cattle is balanced by the hogs fattened following the cattle. While the hogs have been fed thus on corn, at a price ranging from 15 to 25 cents per bushel, pork has been sold at from \$3 to \$4.50 per head, gross.

COLORADO.—*Weld*: Stock-raising has been the most profitable here. As yet this business is pursued to a greater extent than any other. *Douglas*: The grazing of cattle, sheep, and horses. No more grain is raised than is necessary to supply our own immediate wants.

UTAH.—*Rich*: Our income from stock-raising and butter-making has heretofore been our chief dependence, but for the last two years, since the grasshoppers left the county, we have been benefited as much probably by raising small grain. Its value as a marketable article is not so much to us, living so far as we do from any railroad, but for home-consumption it is of great value, as formerly we had to go to a distance to purchase it, and then freight it.

WASHINGTON.—*Walla-Walla*: Sheep-raising, for the reason that sheep graze all the year round without feeding.

DAKOTA.—*Hanson*: Stock-raising; first, on account of distance from market; second, fine grazing and excellent meadows of red-top and blue-joint, yielding from

one and a half to two tons per acre. Good water can be found in the creeks, rivers, and springs that abound in this vicinity. Young stock generally graze the year round. Wheat and oats yield good returns.

TEXAS.—*Nueces*: Wool-growing. Some of those who were formerly engaged in raising cattle and horses, and had followed it for years, and could scarcely make ends meet, have purchased sheep, and have been enabled, from the sale of wool and mutton sheep, to purchase land, build comfortable dwellings, and get around them a few comforts in a short space of time. A few crosses of the Merino or Mexican (the foundation of all our flocks) will produce a sheep that will average 4 pounds of unwashed wool per year; those more highly improved produce from 7 to 8 pounds. The average price of such improved wool is about 20 cents per pound, specie, sold at Corpus Christi. The expense for care and attention of a flock of 1,200 ewes, adding shearing, &c., and hauling to market, 4,800 pounds wool, is less than \$250, coin. The increase from 1,200 ewes, when well taken care of, will average 80 per cent. per annum, allowing 20 per cent. for losses, which increase can be sold, at 18 months old, at \$2, coin, per head. Hence we have 4,800 pounds of wool, at 20 cents, \$960; 960 increase, at \$2 per head, \$1,920; total, \$2,880; expenses as stated above, \$250; interest and taxes on sheep and land, \$400; total, \$650; net profit, \$2,230, gold. From those more highly improved better results are realized.

INDIANA.—*Wayne*: The long-wooled variety of sheep will yield 10 pounds of wool per annum in the dirt, worth from 35 cents to 40 cents per pound, a greater profit than can be produced from any other stock at present.

WISCONSIN.—*Columbia*: Without any foreign fertilizers is constantly enriching our soil and increasing our yield, while raising cereals impoverishes.

MINNESOTA.—*Isanti*: One flock of 70 sheep, well taken care of, sheared 260 pounds. This was sold at 33 cents, netting the sum of \$85.80. This was from the wool alone. Now, add to this the increase from the lambs, and the profit was nearly 50 per cent. upon the investment.

CALIFORNIA.—*Mendocino*: Sheep-raising. *Stanislaus*: Wool pays all the expenses of sheep-raising, and the increase is net profit, and the increase will average 80 per cent. Next follows wheat and barley, providing speculators do not succeed in forming "rings," and depress the price in the San Francisco market.

UTAH.—*Salt Lake*: Wool-growers fared the best, though they were not able to realize 50 per cent. of the ruling prices of former years. From 1,000 sheep, valued at \$3,000, wool was clipped to the amount of 5,000 pounds, selling for 22½ cents per pound, amounting to \$1,125; increase of lambs, 650, at \$1 each, \$650; total, \$1,775; total expense of herding and shearing for one year, \$570, leaving a net profit of \$1,205 on the investment.

MARKET-GARDENING.

MASSACHUSETTS.—*Dukes*: The county is rapidly gaining popularity as a watering-place. The demand for early produce is large and it commands high prices. There are now on Martha's Vineyard about 1,000 cottages, owned by summer visitors. No farmer gives his whole attention to this branch, but it is not uncommon for one to sell \$200 worth of early produce from a single acre.

RHODE ISLAND.—*Kent*: The most profitable branch of farming in this State, particularly on the borders of the Narragansett Bay and along the Blackstone and Pautuxet Rivers, where our principal manufactories are situated.

NEW-YORK.—*Kings*: The county is almost exclusively engaged in raising vegetables for the New York and Brooklyn markets. Early cabbage, with squash for a second crop, was perhaps the most profitable crop. Most of our early crops have brought good prices. Our late crops have not paid us for our labor.

NEW JERSEY.—*Hudson*: Our farmers are selling or leasing their farms to market-gardeners, who are doing a large and lucrative business.

VIRGINIA.—*Accomack*: Trucking, particularly in sweet and Irish potatoes. *Princess Anne*: One barrel of Early Rose potatoes was planted on less than one acre. Cost of seed, \$5; 1 bag of guano, \$7; 25 loads of barn-yard manure, \$25; labor, \$10; rent of land, \$5; digging and transporting, \$30; total, \$82. Yield: 30 barrels, sold at Norfolk at \$5.50 per barrel, \$165; net profit, \$83. The same land was planted in corn, which yielded 8 barrels, sold at \$3 per barrel, \$24. The fodder paid for the cost of cultivation; making the net profit on less than an acre, \$107. *New Kent*: Trucking. All the large farmers turn their attention almost exclusively to grain, and after paying expenses for labor, taxes, &c., do not have sufficient left to pay the interest on their lands at assessed value. The small farmers, with a small amount of labor, and without capital, manage to make a living by trucking. I have known as much as \$250 made on one acre in cabbages, and other vegetables in proportion. *Gloucester*: Vegetables and strawberries have been very remunerative. *Nansemond*: Trucking. It has not yet become general, but is on the increase.

KENTUCKY.—*Jefferson*: A large number of Germans are engaged in the market-gar-

dening business very successfully. They haul from the city (Louisville) the stable manure during winter months, and their care and labor is rewarded with good yields.

DAKOTA.—*Pembina*: Market-gardening has proved most remunerative during the past season, having had a ready sale for onions at \$1.25 to \$2 per bushel; carrots, parsnips, and beets, 75 cents per bushel; cabbage, 10 to 25 cents, and everything else in proportion. All the garden-vegetables growing finely on new ground, and without manuring. One of our best farmers raised last season, on a flat of 70 square rods, 264 bushels of large red onions, every onion in the patch weighing half a pound. Our soil also produces some of the largest and finest root-crops.

POTATOES.

NEW YORK.—*Saratoga*: The only export from the county; have been a very good crop and brought excellent prices.

GEORGIA.—*Lumpkin*: Quite a number of farmers raised 150 to 200 bushels of sweet-potatoes per acre. It costs not more than \$15 per acre to raise and house them, and they sell for at least 50 cents per bushel. *Charlton*: The question lies between sweet-potatoes and the sugar-crop. Considering the outlay necessary to make sugar, sirup, and molasses, I decide in favor of sweet-potatoes. They are produced, collected, and housed with ordinary farm-implements, without additional outlay of money, which, to the poor man, is a strong argument in favor of this crop. Of the yam variety I have grown on one acre 330 bushels of large, fine, yellow yams. The land was sandy, (no clay,) on a hill-side facing south-southeast.

ALABAMA.—*Russell*: Sweet-potatoes. Farmers have sold their surplus potatoes readily at \$1 per bushel, which paid much better, according to acreage, than cotton.

MISSISSIPPI.—*Warren*: Sweet and Irish; the average value being about \$1 per bushel, and the yield 75 to 90 bushels per acre.

TEXAS.—*Grayson*: Sweet-potatoes, though the crop is a limited one. The expense and yield per acre are about as follows: Seed, \$5; preparing ground and planting, \$10; cultivating and harvesting, \$15; total expense, \$30. In an ordinary season the yield is 150 to 200 bushels, worth 50 cents to \$1 per bushel, leaving a profit of \$120 to \$170 per acre. The expense of cotton, including gathering, &c., is about \$20 per acre, and it is a good crop that yields 400 pounds of lint per acre, which, at 12 cents, leaves only \$28 profit.

WEST VIRGINIA.—*Warren*: Potatoes, as a field-crop, are growing in importance every year, yielding, when properly manured and cultivated, 100 bushels per acre, worth now in our local market \$1 per bushel. Hay is next in order of profit, yielding, with no outlay for manure, and comparatively little labor, one and a half tons per acre, worth at home \$18 per ton.

KENTUCKY.—*Kenton*: Potatoes are produced at the rate of 70 bushels per acre, and are worth \$1.25 per bushel, or \$7.50 per acre.

INDIANA.—*Steuben*: The average yield of potatoes is 125 bushels to the acre; price during the winter 60 cents per bushel; this spring \$1 per bushel, or an average price of 75 cents per bushel, or a total of \$93.75 cents per acre; cost of production, seed, and labor, \$29.40, leaving \$64.35 for a clear profit.

HAY.

Except in locations where an equivalent in manure is obtained in market for the hay sold, the principal reasons in favor of and against producing it as a market crop are tersely stated by one of our correspondents thus: "If it were not for depriving the farm of manure by selling its products instead of feeding them, raising hay and grain for sale would seem to have been the most profitable the past year, indeed for several years past. But we shrink from this method, because we think a man, in producing it, would be just hauling his farm off to the city."

MAINE.—*Sagadahoc*: Quite a good home-market in the villages that dot the county. *Waldo*: Large quantities shipped at fair prices. *York*: One-half the land in the county is pasture and one-fourth field; seven-eighths of the field is mowed. All last season the pastures were fresh, and the hay-crop was abundant and well secured. Young cattle and farm-oxen gained 25 per cent. I consider the pasturing and hay of more value than all other farm products combined; seven-tenths of my income is from grass and hay, while the proportion of expense is less than is required for other crops. From 30 tons of hay, worth \$360, fed to my young cattle, the sales were \$300, values remaining the same; from 24 tons, worth \$360, fed to 12 cows (butter at 30 cents) the

sales were \$436. My conclusion is that when the "gude wife" is a good dairy-woman butter-making is very profitable, but when hired men manage the dairy it is poor business.

MASSACHUSETTS.—*Franklin*: Hay and grazing; some say tobacco, but in a long race I doubt it. *Plymouth*: Our principal branch grass and hay, but our most profitable crops are vegetables and small fruits. Strawberries are found to afford more profit in this county than tobacco in the Connecticut Valley. *Berkshire*: Has become the staple crop, owing probably to the high price of labor. In raising and curing grass all, or nearly all, the outlay for extra labor is limited to haying-time. When the crop is secured the outlay ceases until the next hay season. Meadows are now kept up more by top-dressing than formerly, and of course less plowing and less labor are called for. The market for hay is good at all seasons at remunerative prices and ready cash.

CONNECTICUT.—*New London*: Since September 1, 1873, hay has been selling for \$23 to \$30 per ton, and at that price farmers can make more by raising hay for market than any other produce. Next to hay is the potato-crop. Some farmers who planted their potatoes early sold the crop as high as \$3 per bushel, and from that down to \$1. Of farm-stock, sheep have paid the best the past year on the capital invested.

NEW YORK.—*Seneca*: From 15 acres, first cutting, I gathered without damage 41 two-horse loads of hay, consisting of small red clover, Alsike clover, and timothy. I think the hay would weigh at this time 40 tons. Eight loads, estimated at 8 tons, in one mow, recently sold at \$15 per ton in the mow. Forty tons at \$15 per ton equals \$600; cost of cutting and storing, \$2 per ton; net profit, \$520; value of second cutting, after thrashing out the seed, which offsets all expenses, \$40; net profit per acre, \$37.33. *Rockland*: Gathered in fine order, at comparatively small outlay, and sold within the country for \$30 to \$35 per ton. *Fulton*: Particularly so where farmers sold soon after harvesting, when hay netted them from \$22 to \$26 per ton.

PENNSYLVANIA.—*Cambria*: Cannot compete with the West in growing grain even for our own home market. Good cultivators lose no opportunity to buy manure to top-dress their meadows, many of which are seldom if ever cultivated. *Lehigh*: The average yield is $1\frac{1}{2}$ tons per acre, with a ready market at the numerous furnaces, iron-ore pits, and slate quarries, at an average price of \$25.

VIRGINIA.—*Henrico*: The production of forage in its various forms, hay and grass edominating in amount. Within the last three years the amount of forage grown in the county has been greatly increased—perhaps more than doubled. Three or four years ago it was not uncommon to see baled hay from the city brought from the North or West, being hauled into the country to be consumed by farmers on farms that, devoted to grass, would produce nearly an average of two tons of hay to the acre. Now, a day seldom passes that we do not see wagon-load after wagon-load of baled hay going into the city, till we begin to wonder where it all comes from. And yet it is more profitable to grow winter-oats for forage than hay. Winter-oats will average a product of over 2 tons of forage to the acre; 4 tons to the acre are not uncommon, and more than that has been grown on every acre of a twenty-acre field.

GEORGIA.—*Burton*: One and a half to three tons per acre, at a cost of about \$6 for sowing and marketing; getting the hay at 25 cents per 100 pounds. Nothing else pays so well.

ARKANSAS.—*Yell*: The German millet hay in the bottom-lands; three tons per acre have been the average, worth \$30 per ton in the stack on the ground. Cost of producing, \$13 per acre; clear profit, \$77.

TENNESSEE.—*Carter*: Clover and other hay-crops. The clover averaged two tons per acre, worth \$10 per ton; cost of getting it ready for market not more than \$3 per acre; profit per acre, \$12. Nothing else did as well in proportion to outlay. *Sumner*: The greater part of this was produced from Hungarian grass. Some of our farmers sowed as much as one hundred acres, producing two tons per acre, and worth in stack or rick, \$14; making a net profit of \$18 per acre. *Bedford*: Our meadows produced about two tons per acre, worth \$15 per ton, and less labor required to raise it than any other crop. *Obion*: One of my neighbors on thirty acres raised eighty tons of hay; paid out, besides the labor of himself, some \$21 for expenses. The eighty tons, at \$20, are worth \$1,600. Others have similar results. *Greene*: Each year brings more conviction that more hay and grass, and less growing of grain, add to the profits of our farming. *Giles*: Worth \$20 to \$22 per ton.

WEST VIRGINIA.—*Wayne*: Timothy for hay principally raised and the most profitable. The value per acre of corn, wheat, and oats, when harvested, was from \$8 to \$25; the amount of timothy was about 2 tons to the acre, and the price being \$17 per ton, or more than \$34 per acre, and the cost of culture much less than the other crops. *Mineral*: A good crop of hay will produce 2 tons to the acre, and worth at least \$25 per ton, or \$50 per acre. Corn, average crop to the acre, 35 bushels, at 60 cents per bushel, \$21; oats, 35 bushels to acre, at 70 cents per bushel, \$24.50; wheat, an average crop 15 bushels to the acre, at \$1.25 per bushel, \$22.50. From this showing, it is evident hay is the most valuable.

KENTUCKY.—*Laurel*: Twenty acres in meadow yielded 30 tons of good hay, and

this, at \$10 per ton, is worth \$300; deduct \$100 for cutting and stacking, will leave \$200 profit on this crop.

OHIO.—*Tuscarawas*: Hay-crop has yielded $1\frac{1}{2}$ tons per acre, with a selling price of about \$15 per ton, making nearly a net profit of about \$13 per acre. Wheat yielded a profit of about \$10 per acre, and corn \$5 per acre. *Hardin*: The raising of hay has been the most profitable, and the expense of securing it much less than many other crops. *Williams*: A farmer here cut 22 tons of hay off of 12 acres; the hay was worth \$12 per ton at the meadow. The pasture was worth at least \$2 per acre in the fall, making a total of \$200. Adjoining this meadow was another 12-acre field of equal fertility, which was sown to wheat, and produced 17 bushels per acre, and worth \$1.25 per bushel at time of thrashing, amounting to \$255. The cost of cutting and curing hay was \$2.50 per acre, while the cost of plowing the ground, harrowing, sowing, and harrowing again twice, was \$32.50, and the cost of seed, 13 bushels, at \$1.50, (at time of sowing,) would amount to \$27. The hauling in and thrashing (including cutting) cost 16 cents per bushel, amounting in all to \$134.50, leaving a balance of \$120.20.

MICHIGAN.—*Mecosta*: The average crop of hay here is 1.23 tons per acre, the average cost of harvesting the same \$3 per acre, and the average price per ton up to this date is \$18, which leaves for the use of the land \$20.04 per acre. This is making no allowance for manuring and preparation of the soil, which is much less than for any other crop raised.

INDIANA.—*Cass*: A neighbor of mine sold 55 tons of hay (raised on 30 acres of land) at \$15 per ton, making a total of \$825; the expenses, including interest on land, taxes, mower for cutting, raking, hauling to barn and to market, footed up \$370.50, leaving a clear margin for profit amounting to \$454.50 in favor of the crop. *Brown*: Our land yields from 1 to 2 tons per acre of timothy hay, without any artificial manuring, and would produce more by being manured. The hay sells readily at \$7 to \$10 per ton at home.

ILLINOIS.—*Grundy*: Timothy grass seed most profitable; the average yield is 4 bushels per acre, and the average price \$3. *Hancock*: The steady market price of hay, economy in harvesting and marketing, are inducements in favor of this branch of farm products. The usual yield is 2 tons per acre on good meadows, bringing from \$12 to \$15 per ton. An inferior grade mixed with clover, red-top, &c., does not bring so much by \$3 to \$5 per ton in the Saint Louis markets.

IOWA.—*Jefferson*: As much as \$16 per acre has been realized this year from timothy alone, which, taking into account the amount of labor, is very productive.

COLORADO.—*El Paso*: Hay seems to yield the greatest percentage for the amount of outlay, and the necessary labor to produce and market it. I know a farm that cost some \$2,500, that produced this year \$2,000 worth of hay, (natural grass.) We have a blue-grass here that is far superior to the best timothy that can be produced in the States. The farm referred to, next year, will produce \$3,000. Cattle are also profitable; it is no uncommon thing for a spring calf that is slaughtered to dress 200 to 300 pounds, taken from the range, and never having tasted grain.

FRUIT-GROWING.

NEW JERSEY.—*Atlantic*: The light soil of this county will probably prevent it from ever becoming devoted to farming, in the ordinary sense, as the raising of grass, grain, stock, &c. Some have turned their attention to the culture of small fruits, mostly strawberries. M. D. Lake has 15 acres in this fruit. The severe drought last season cut the crop short, and he, to avoid loss from this source in the future, has constructed a large reservoir contiguous to his field. This he fills with water drawn from a well by wind-power. He designs to distribute the water by cart and sprinkler, similar to those used for streets. Egg Harbor City, a German settlement, is largely engaged in grape-culture, (turning the grapes mostly into wine,) and Hammerton in the culture of strawberries. Lately pear-culture is receiving much consideration. Large orchards have recently been set out. The few orchards in this fruit now in bearing have paid better per acre than any other crop. One of our principal pear-growers, Mr. D. Colwell, manures his orchard once in two years with stable-manure and leaves composted and spread broadcast, and gives clean culture. From a portion, in which the trees are about 14 years old, 160 to the acre, the average yield the past season was 1 bushel per tree, worth \$3 per bushel. Blackberries come next in profit. My crop, probably a fair sample, paid \$125 per acre clear of all expense, except cultivating and hoeing, the cost of which does not equal, or certainly does not exceed, that of corn. They were three and four years old, planted on new land, and never manured.

DELAWARE.—*Sussex*: Especially peaches and small fruits; pears and apples are also grown at a profit. *Kent*: The adaptation of the soil and climate to the growing of a large variety of fruit-products, running through the season from May to December, and the facilities for reaching the Philadelphia, New York, and Boston markets, have induced agriculturists to engage largely in cultivating all kinds of small fruits, as

well as grapes, pears, apples, and peaches. The peach-crop of 1873 was by no means a full one, yet there were shipped from this county nearly 575,000 baskets, (three-fourths of a bushel,) and there were used in canning and fruit-drying establishments 160,000 baskets, making 735,000, which, at an average of 75 cents per basket, amounts to \$551,250. Almost every farm of any pretensions has now its market-orchard.

MARYLAND.—*Dorchester*: With intelligent, judicious culture, care in preparing for market, and marketing, peaches and strawberries have netted \$100 per acre. *Talbot*: This county being in a central position between Baltimore, Wilmington, New York, Philadelphia, and Boston, and having daily connection with these cities, we have found peaches a paying crop the past season, (one of unprecedented drought, and, consequently, very short crops of corn and early potatoes.) On account of the short crop of peaches in more extensive peach-growing sections, peaches in this county have paid from \$75 to \$100 per acre.

VIRGINIA.—*Albemarle*: Grape-culture. The climate and soil of our mountain-slopes seem particularly adapted to the growth of the vine. Some of our vineyards paid as high as \$600 per acre; a great portion of the crop being shipped to New York to the early market, and the remainder put into wine. *Patrick*: The most profitable as regards money or lucrative income; other farming for home consumption.

MISSISSIPPI.—*Hancock*: Fruit—oranges, grapes, pecans, &c. There is scarcely a home in the county where for a few years past more fruit has not been planted than is needed for their own consumption.

WEST VIRGINIA.—*Morgan*: Apples.

OHIO.—*Hamilton*: Strawberries. *Lucas, Sandusky*: Apples.

CALIFORNIA.—*Tuolumne*: In the foot-hills, or northern and eastern parts of the county, fruit and vine raising. Plum-culture is the most profitable at present. Dried pitted-plums sell readily in San Francisco at 18 to 22 cents per pound. Half an acre of young trees last year produced 2,500 pounds dried pitted-plums; deducting 13 cents per pound for drying, boxing, freight, commissions, &c., about 7 cents per pound is left for a profit, less the expenses of cultivation. *El Dorado*: Fruit-raising; in my immediate vicinity wine and brandy are made, in another locality the manufacture of raisins is carried on extensively.

TOBACCO.

MASSACHUSETTS.—*Hampshire*: Has been the staple crop; remains unsold.

CONNECTICUT.—*Tolland*: The crop as yet remains almost wholly unsold, although in the adjoining county of Hartford it has sold well. Market-gardening and the raising of strawberries I think may yet supersede tobacco-raising. *New Haven*: Where the soil is adapted to it, paying double the amount any other crop does. One acre of good tobacco will sell for from \$250 to \$300.

MARYLAND.—*Charles*: In several instances 5,000 pounds per hand have been made, and in some cases bringing 10 cents per pound. *Saint Mary's*: For the last few years tobacco has been considered by farmers the most profitable, but I much doubt if it will be much longer. The price has decreased much the last two years. There are a few peach-orchards in the county which were very profitable the past year; in some cases exceeding \$200 per acre. *Howard*: Our farmers think there is more money in tobacco and hay than any other products, though the price which some have obtained for their wheat the past season, \$1.80, makes it a remunerative crop.

VIRGINIA.—*Nelson*: The common experience of farmers and planters in the county is clear and definite on this question. *Pittsylvania*: The main staple, and brings remunerative prices. *Louisa*: Beyond comparison. As in tobacco-culture, the area is comparatively small; we can manure heavily at small cost. The cultivation requires but little horse-labor, and as the women and children needed in the process can be hired for not more than one-third of men's wages, there is a very important saving in this respect, the average price paid for laborers in tobacco being 25 cents per day. Our soil and climate also are especially adapted to tobacco. *Campbell*: Supposed to have been, but as the bulk of the crop will not be disposed of till May or June next, there is some uncertainty. The prices paid at present are scarcely remunerative. *Spotsylvania*: A good acre of tobacco will yield 1,200 pounds, at 10 cents, \$120; a good acre of wheat, 25 bushels, at \$1.75, \$43.75. *King William*: The only farmers among us who have done well for a year or two are those who have either made tobacco a specialty or have largely divided its culture with that of the cereals. *Buckingham*: The absorbing crop in the county, and although prices have ruled much lower than we expected, it has paid better than any other crop. A good hand can cultivate 3 acres in tobacco; average yield last year, 650 pounds; 1,950 pounds, at 9 cents per pound, gives \$175.50. The same hand could cultivate 5 acres in corn; average yield, 19 bushels; 95 bushels, at 59 cents gives \$56.05; difference in favor of tobacco, \$119.45. *Lunenburg*: I consider the system a bad one, and a cause of the general poverty of land and people. With the best farmers in the county the net profit on tobacco is but little more than suffi-

cient to pay taxes and other necessary expenses, leaving nothing to compensate for impoverishment of the land. *Charlotte*: The only reliable and paying crop in this county. *Rockbridge*: One tenant of mine made \$330 on 4 acres. His family, consisting of a wife and three children, under 12 years of age, helped him work his crop. *Mecklenburgh*: Decidedly. It is the only crop we can cultivate that will pay well after deducting expenses to market. *Goochland*: Decidedly. The crop was a heavier one than for many years, and the quality as a general rule is good. *Fluvanna*: Our farmers concur in the opinion that tobacco pays better in the general than any other crop. *Caroline*: Beyond all question. *Henry*: Because no other crop will bear transportation.

NORTH CAROLINA.—*Stokes*: A good hand can raise from 1,500 to 1,800 pounds, if skillful in managing, which will bring 20 to 30 cents per pound. At the same time he can make a superabundance of corn, wheat, rye, oats, hay, beef, pork, and vegetables for family supplies. *Person*: The only branch in the county followed for profit. *Caswell*: Almost the only crop relied on as a source of profit.

GEORGIA.—*Decatur*: The cultivation of Florida or Cuba tobacco (used, I am informed, for wrapping) has undoubtedly been the most profitable.

TENNESSEE.—*Montgomery, Jackson, Dickson*: One acre will produce 800 pounds, which, at the low price of 6 cents, gives \$48. One hand will work and house the tobacco on 6 acres. The hand, horse, and plow will cost \$20 per month for 6 months.

WEST VIRGINIA.—*Tyler*: One acre of new ground planted in tobacco will yield 800 pounds; at \$3.75 per hundred, will give \$30. One acre planted in corn will yield 20 bushels; at 45 cents per bushel, will give \$9, showing an excess of \$21 per acre in favor of tobacco. Again: one acre of old ground (sod) in tobacco will yield 1,200 pounds; valued at 4 cents per pound, will give \$48. The same ground planted in corn will produce 40 bushels, at 50 cents per bushel, amounting to \$20, showing a balance again in favor of tobacco of \$28 per acre. *Mercer*: Ten acres of raw land planted in tobacco yielded a crop of 10,000 pounds; and this, at an average value of \$10 per cwt., gave the producer \$100 per acre.

KENTUCKY.—*Graves*: There were about 8,000 acres in cultivation with tobacco last year, at an average of 700 pounds per acre, making a total of 6,300,000 pounds produced in this county. *Christian*: Tobacco rarely fails, and the average price is from \$5 to \$10 per hundred. Three thousand pounds to each hand is considered a good yield, and requires about one-half of the hands' time. *Darves*: Our land often produces 1,500 pounds of tobacco per acre, ranging in price from \$3 to \$10 per cwt. *Lewis*: In one instance a farmer cultivated 1,500 pounds of tobacco to the acre, and realized \$22.50 per hundred; this, however, was on superior tobacco-land. Land that will grow tobacco without the aid of fertilizers can be bought for \$10 per acre. *Adair*: Tobacco yields more actual money than any other crop. Grain is generally fed to stock, such as mules, cattle, and hogs, and they have not commanded good prices. Parties taking mules South have lost money.

OHIO.—*Adams*: Tobacco pays from \$50 to \$125 per acre, and the cost of producing amounts to only from \$18 to \$30 per acre. *Finton*: We calculate on 1,100 pounds of tobacco to the acre, and even at the present low price would be worth \$33.50, and the cost would not be more than \$18 to put it in the market.

AGRICULTURAL IMPROVEMENT.

The second question propounded in the March circular embraced three leading points: First, economy and efficiency of labor; second, systematic and rational processes for its employment; third, advanced intelligence and skill in its direction.

From the replies of our correspondents, we gather fresh evidence of the fact that the amount of muscular force in the country available for agricultural labor is relatively if not actually diminishing, and that it bears a smaller ratio to the work expected of it than formerly. Every year it becomes a more costly element of production. This is a very troublesome fact, but it has a deeper significance than the mere derangement of existing social settlements. More generous remuneration for manual toil is a tendency in the direction of a higher civilization. It implies the elevation of the laborer to a more independent and dignified social position and a higher development of individual manhood. The temporary inconveniences which result from this elevation of the laboring classes will, of course, bear heavily upon vested interests, but such collisions have marked the course of civilization in every stage.

To adjust the economic disturbances created by the increased price of

labor, it is not necessary to roll back the tide of progress and reduce labor to the mere mechanical thing which it was in the past and which it still is in oriental countries. Such labor could not meet the want of the present age if it could be secured. Unskilled labor is annually becoming a greater drug in the labor-market. The increased demand for intelligent and effective *work* will call forth its own supply. A laboring population that cannot meet this demand will, of course, be displaced by more energetic competitors. The chronic complaints of inefficient and unreliable labor from almost every quarter indicate the presence of temporary abnormal conditions which cannot long resist the spirit of progress. The evil will work its own cure.

The change in the conditions of production, resulting from the enhanced cost of labor, is a practical question which American farmers are trying to solve by practical methods. Three sources of relief are contemplated in our March returns. First, it is well known that, in the past, labor, like other elements of production, has been wastefully used. To stop this waste and to redeem its resulting loss is now a prominent concern among our farmers. Secondly, it is now seen that human labor is too costly and valuable to be wasted upon the heavier mechanical tasks of agriculture. The laborer is no longer the mudsill of society. The forces of nature, mechanical, chemical, and vital, have been more generally called into requisition, indefinitely increasing the amount of motive-power available in production. Several years ago the London Times estimated the steam-power, propelling, manufacturing, and mining-machinery in England at double the muscular force of the entire human race. In later years the more elaborate forms of mechanism have been applied in an increasing degree to agriculture. The laborer, relieved from the drudgery of elementary toil, is gradually exalted to the labor of direction. The scope of progress in this direction seems to be practically unlimited. This exaltation of labor, combining a small proportion of costly intelligence with a great mass of cheap, dead, mechanical power, will ultimately cheapen production, as it already has done in manufactures, and remove the difficulties of our present transition stage of agriculture. Thirdly, economic science has detected an enormous waste of productive power in the slovenly farming of the present day. Fertilizing principles are allowed to escape into the atmosphere, or to be washed away by the rains, which, if carefully saved, would have restored the declining fertility of the soil. Farmers in all parts of the country are awakening to this suicidal course, and now intelligent efforts are being put forth to arrest this fatal drain upon our natural resources. But the same economical principles are applied to all branches of farming enterprise from its highest generalizations to its minutest details. The management of the farm, the direction of the labors of cultivation, is now no longer a mere hap-hazard matter. Here is found scope for the highest practical intelligence and for the finest administrative talents. The system of farming which ignores these elements of power will necessarily fall behind, and those parts of the country cursed with its presence will continue to export their labor and capital to more energetic regions until they are left exhausted and helpless. A few such counties are found in every portion of our country. In some regions the rule of this old and asphyxiated conservatism is just beginning to be broken; but the great majority of our reports indicate progress of some kind, while in many cases the most advanced scientific improvements have been successfully inaugurated and have already shown their normal results. The method of co-operation, of intelligent comparing of results and processes, and of diffusing intelligence by the press, and

by oral discussion, is applied in a grander scale than ever before known. Special skill and remunerative results are developed *pari passu* with general intelligence in progressive counties. This cannot fail to excite emulation in less favored communities and to stimulate a more effective handling of natural resources, thus enlarging the scope of production and adding to the general happiness of the whole.

New England, with limited agricultural resources and devoted especially to manufacturing industry, has long felt the drain of her agricultural population to the richer lands of the West and South. The presence of a large consuming population has largely directed cultivation to special branches, thus breaking up its completeness as a co-ordinate branch of industry and creating a class of conditions not the most favorable to improvement. Yet even here cheering aspects of the problem are frequently presented, though the superior attractions of other industries have exerted a depressing influence upon agriculture by withdrawing capital, labor, and intelligence.

In the Middle States, where agriculture is practiced less in subordination to other pursuits and on a more complete and independent system, our reports of improvements are far more numerous and important.

Stationary communities are comparatively few. The growing insufficiency of labor is here a matter of serious concern. In some cases the difficulty is hopefully and successfully met by the employment of more labor-saving machinery and by better tillage. In other cases crops requiring an excessive amount of labor are abandoned and large areas lately in grain are put down in grass. The cheese-factory exercises an important influence in diversifying production in a large number of counties.

Maryland is more closely assimilated to the Middle States than to the South Atlantic coast States with which it is usually classed. Lingered traditions of the old system of labor still resist progress in some counties. In others the proper employment of the freedmen is still an unsolved problem. The system of working on shares has resulted in a serious deterioration of the soil. In other counties, however, the evidences of progress are unmistakable and cheering. Montgomery County, for instance, has doubled its rate of production per acre. In Virginia, the oldest agricultural community of the Union, and in the States farther south, the extremes of conservatism and progress are in still greater contrast. The cotton mania still holds sway over common sense in many counties in spite of the lessons of experience. In some parts of South Carolina the freedmen are purchasing homes and are energetically improving them. In some parts of Georgia there is a growing attention to improved culture and implements, but elsewhere is visible the same inertia that has paralyzed progress in the past.

Of the Gulf States Florida reports a general absence of improvement. Alabama and Mississippi are more hopeful; several counties report improvements in general knowledge and in practical skill in farming. Improved implements and processes of culture have been introduced and a better understanding between laborers and employers noted. In Texas the progress of improvement is more general in consequence of an enormous immigration; the population is rapidly changing and old traditions are fading out. In the inland States, Arkansas, Tennessee, West Virginia, and Kentucky, the indications of progress are far more numerous and hopeful than in the Gulf States. There is a healthy tendency in some counties toward mixed husbandry. Improved breeds of farm-animals and processes of culture are of frequent mention. Enterprises in fruit-culture are quite promising. Improved farm machinery

has been extensively introduced, thus opening up an escape from labor-difficulties.

In the States north of the Ohio River improvements have been thorough and wide-spread in the use and economy of labor, in improved processes of culture, and in general and special farming intelligence. Draining and underdraining in single counties, during the past year, have added thousands of acres of swamp-lands to the productive area, and have improved the fertility of thousands more. The difficulties of the labor question are felt here as elsewhere, but they are met with intelligent and persistent effort, the good results of which are already visible. In some newer counties where cultivation is yet in its infancy, and in some older counties where it labors under old traditions, our correspondents reluctantly report no visible progress; but even in these cases the advance of ten or twenty years is quite marked.

West of the Mississippi the extent of newly-settled land, and the brief period of its cultivation, preclude the gathering of many lessons from experience, while the abundance of a virgin soil has prevented the necessity of improvement from being felt, yet the spirit of progress is strongly developed in numerous localities. There is already a partial substitution of recuperative for exhaustive culture. The increase of agricultural reading, and the popular anxiety to secure the latest and best processes of culture, are auguries of good.

On the Pacific coast agriculture has been compelled to adapt itself to new natural conditions and resources. In many counties this problem is treated with a sober and scientific intelligence, from which permanent and satisfactory results have already sprung. Here, also, the labor question has been prominent, and the necessity of improvement sharply impressed by circumstances. Our reports from the Territories show an unexpected adaptation of new processes and implements, even upon the frontiers of civilization.

The following notes from our correspondence will give some idea of the state of improvement in different States:

MAINE.—*Sagadahoc*: Nearly all of the improved implements are now extensively used in this county. *Waldo*: Increased use of machinery in agriculture. Agricultural publications all more largely patronized, better stock is being introduced, and farmers are taking a higher social position. *Penobscot*: The severe drought of the previous years cut short the hay-crop, and we were forced to make a little take the place of much, hence we gave our stock about two-thirds as much hay as formerly; the stock was healthier, and did better every way. *Franklin*: Gradual introduction of labor-saving machinery. *York*: No improvement; the young men go into other callings. *Androscoggin*: Not noticeable. *Oxford*: None.

NEW HAMPSHIRE.—*Sullivan*: Improved machinery, so far as adapted to our rough, high land; nice new residences, with clean grounds, painted fences, and improved out-buildings. *Cheshire*: Improvements shown in a comparison of the mode of making hay at the present time with the method pursued twenty years ago, when a man with 50 acres of grass would employ about five hands, with their scythes and hand-rakes, five or six weeks to secure it, while it would now be secured in much better condition by three men with a mowing-machine, hay-tedder, horse-rake, and hay-caps, in twenty days. The saving is equally as great by the use of improved machinery in the cultivation of crops. *Carroll*: The day is not far distant when the men who till the soil must do it scientifically, or they will fail of a competence. *Strafford*: Not worth naming. *Belknap*: Very little. *Coos*: But for the machinery already introduced our land would be turned to pasture or forest.

VERMONT.—*Addison*: Improved condition of farms, buildings, and neat stock. *Franklin*: Marked improvement in our dairy products, the result of more systematic and rational processes, and of advanced intelligence and skill; the improvement of our dairy-stock has been very considerable, both by rational breeding and by judicious purchases from abroad. *Washington*: Greater use of machinery. *Rutland*: Improved machinery, but declining cultivation. *Caledonia*: Improved dairying. *Essex*: Improved machinery.

MASSACHUSETTS.—*Plymouth*: Improved farming utensils are in use, but the general condition of farms and farmers is much the same as many years ago. Farms are not so

valuable here as they were twenty-five years ago. *Franklin*: Underdraining and economy. *Bristol*: No systematic farming. *Middlesex*: Improved machinery, but great lack of rational processes in farming. *Berkshire*: Better care of domestic animals; they have better shelter, stables of more equal temperature, and more care is taken to keep animals out of storms; two objects accomplished by this—economy in feed and health of stock.

RHODE ISLAND.—*Kent*: Few farms in the county admit of machine-work on an extended scale. Young men that have advanced intelligence and skill leave the farm for the workshops and other congenial occupations. *Newport*: A ton of hay is secured at less than one-half the amount of manual labor that was formerly required.

CONNECTICUT.—*New Haven*: New buildings are put up for curing tobacco; considerable attention given to the question of manures for that crop. *New London*: We are slow to take up improvements. *Litchfield*: Considerable awakening to the necessity of improvement. *Tolland*: The least said the better. Manufacturing, our leading industry, fixes the status of labor.

NEW YORK.—*Saratoga*: Gradual improvement in stock; better breeds grown. *Steuben*: Farmers are evincing a higher appreciation of their calling by better tillage, fences, buildings, and ornamental surroundings. *Sullivan*: There is a gradual change in the direction of smaller areas under culture, with better tillage and consequently larger yields per acre; more money is brought into the county, and times easier than some years ago. *Onondaga*: Improvement in preparation and fertilization of soil and in culture; more gypsum and barn-yard manure used, and the truth more fully realized that the best-worked lands pay the best. *Otsego*: There are numerous factories in the county, using the milk of from 100 to 400 cows, and generally giving satisfactory results. *Schenectady*: A flourishing agricultural society, and also a farmers' club, together with the increased circulation of agricultural papers, evince greater interest in the subject of farming. *Chemung*: Increased attention to the proper gathering of the hay-crop. *Genesee*: Progress is slow, but the present time is far ahead of thirty years ago. A day's labor produces enough more now than then to leave a balance after counting the cost of teams and machinery, which have in part superseded human muscle; also in general intelligence and culture of the mind, farmers have greatly advanced. *Erie*: The land is worked more thoroughly and more manure used than formerly. *Livingston*: Steam is being introduced for thrashing.

NEW JERSEY.—*Hudson*: The reclaimed lands in this county are doing well, and fair crops have been realized. Some energetic efforts are being made to induce the youth in this county to enter the agricultural college. *Sussex*: It is generally remarked that farmers are hiring less help than formerly and are abandoning those branches of husbandry which involve the outlay of much money for wages. The character of farm-laborers, if measured by the amount and the quality of the work done by them, has been gradually depreciating for several years. *Warren*: The price of labor being so high, the farmers are putting more of their land into grass.

PENNSYLVANIA.—*Mercer*: Land is rising in value; improved farm-implements used; general aspect of the county improving. *Tioga*: General use of the modern improved agricultural implements; a great saving over the old system of hand-labor; nearly all the stock kept on the farm, consuming less feed and producing more manure. *Pike*: Actual experience has demonstrated the advantage of a four years' rotation; commencing with corn and potatoes, plow in clover about the last of April, plant about the 15th of May, 3 feet apart, in rows each way, manure in hill with wood-ashes, compost of poultry-droppings and gypsum, one-third of the former and two of the latter, plowing frequently in dry weather; second, oats following corn and potatoes; third, timothy and clover, or wheat and rye; fourth, hay and pasture. *Centre*: Soiling of cattle to a limited extent has been practiced with satisfactory results; whenever the system of pasturing ceases in our grain-growing districts, agriculture will, it is thought, nearly, if not quite, double in its increases. *Butler*: Better dwellings, barns, and out-buildings. *Cambria*: Many farmers yet cut sixty to eighty acres of grass with the scythe; commercial manures are almost unknown; lime is not used to any considerable extent on account of its cost, (20 to 25 cents per bushel.) *Bucks*: Regular rotation of crops. *Chester*: New and improved butter-boxes, prints, workers, churns, and new pans; also new feed-cutters, steam-engines for power and cooking, and a gradual improvement in care and manner of feeding stock is apparent. *Dauphin*: Labor-saving machinery and systematic processes, especially with regard to feeding stock; some of the farmers are demonstrating the utility of cutting up their corn-fodder and feeding it, mixed with grain. *Fulton*: Improvement in the efficiency of labor by procuring every kind of machinery for farm purposes; also in erecting houses, barns, &c., with a view to convenience, comfort, and saving labor. *Clearfield*: The stump-machine has been introduced in many parts of the county, preparing the farms for the use of the mowing-machine, reaper, and horse-rake. *Elk*: Clover more sown as a fertilizing crop; agricultural papers more generally read; perceptible improvement in the conversation of farmers in regard to their calling, all of which are evidences of progress. *Washington*: Steady advancement in the choice of farming utensils. *Westmoreland*:

Universal introduction of machinery, operated either by horse or steam power, in the out-door labor of the farm; and within doors, in sewing, washing, churning, cooking, scouring, &c. *Lehigh*: On account of the high price of labor, farmers are obliged to have all kinds of machinery.

DELAWARE.—*Kent*: Considerable improvement in farm-implements; farmers' clubs and other associations discuss agricultural questions with interest and intelligence.

MARYLAND.—*Saint Mary's*: Except in a few instances there is little evidence of improvement; very many of the farms being worked upon shares, often by freedmen, the result being rapid deterioration of once-fine estates. The labor system is bad, and getting worse. *Howard*: There is much evidence of awakening energy among our people. Turnpike companies are being formed, new buildings being erected, &c. *Montgomery*: The evidence of improvement consists in the fact that crops have increased 100 per cent. upon equal areas on many farms. Close attention is given to experiments with different fertilizers. *Carroll*: Very few farmers are without some of the improved machinery, such as reapers, drills, thrashers, &c. Steamers and thrashers are generally owned by individuals who go from farm to farm. *Washington*: More improved machinery used; better plowing done.

VIRGINIA.—*Campbell*: Owners of small farms doing their own work are doing well; those depending on hired labor are doing poorly. Freedmen object to hiring by the year because it looks too much like slavery. This has induced the more extensive introduction of labor-saving machinery. *Stafford*: General desire for rotation; more clovering. *Henrico*: Improvement sure, though slow; Virginians are not a fast people in anything. *Lunenburg*: Considerable improvements by new-comers; old settlers still plow the old ways. A northern man has built a barn of the most approved pattern. *Nansemond*: No perceptible improvement. *Prince Edward*: Labor unreliable. *Albemarle*: General advance; fatter cattle and hogs. *Smythe*: Improved implements and culture. *Essex*: Indications of retrogression in practice; some awakening, but no advancement. *Clarke*: No improvement. *Gloucester*: No general improvement. A few are raising larger crops of wheat and corn. Field-pease fully equal to guano in preparing the ground for wheat. *Botetourt*: Very few farm in the old way; less land and more grain is now the motto. *Floyd*: Use labor-saving machinery of all kinds; greater efforts to improve lands by the home-fertilizers. *Loudoun*: Some persons cultivate less land and grow larger crops per acre, bringing it sooner into grass, feeding all on the farm and marketing their grain on foot in cattle, sheep, and hogs; thus making more manure, and saving the freight and hauling grain. *Princess Anne*: Fruit and vegetables are engaging more attention, and large orchards of young apple, peach, and pear trees are now growing. *Grayson*: Some machinery introduced. *Northumberland*: Gradual but slow introduction of improved labor-saving machines, and this is restricted by the stringent circumstances of our farmers. *Nelson*: Increasing use of improved machinery; cutting up lands into smaller farms; more thorough culture; seeding a large quantity of the various grass-seeds. *Pittsylvania*: Mixed husbandry is being slowly introduced, especially by Northern settlers. *Washington*: Very striking evidence of improvement in making manures. *Prince William*: About one-half of the farmers are advancing in systematic and rational farming, rotation of crops, husbanding and application of domestic manures, the seeding their lands in grass, &c. *Buckingham*: There has been a decided advance in the last year or two in efficiency and reliability of the colored population in this county. The men have become more settled in their habits, and devote themselves to agricultural pursuits. Many of them are now skillful and very efficient laborers. The educated young men have shown a most wonderful aptitude in adapting themselves to the changed condition of the labor system since the war. *Orange*: More general introduction of improved farm-implements and light horse-power mills for preparing grain and provender as food for stock; better plowing, subsoiling, ditching, and preparation of the soil. *Fluvanna*: This county is not improving. As a general rule the lands are getting more and more unproductive; both large and small farmers are inattentive to grass and manures. The small farmers who cultivate their own land are doing the best, and some of them lay up money. *Goochland*: But few of our farmers are able to provide themselves with labor-saving machines, &c.; consequently have advanced but very little in intelligence and skill in this particular. *Patrick*: No improvement in economy and efficiency of labor; no efforts made to produce or patronize labor-saving advantages. We have no active, enterprising intelligence in our community. We work the good old way; "as our grandfathers did, so do we."

NORTH CAROLINA.—*Jackson*: Gradual improvement in agriculture; increase of good machinery each year. A small valley in the county which at the close of the war produced 600 bushels of wheat now yields 3,000; and its hay-crop is doubled. There is a growing disposition to plant more orchards, and raise more grass and wheat and less rye and corn. Sheep and cattle are encroaching upon hogs and horses. *Burke*: Our system of labor has greatly improved, and is still improving. Since emancipation the false idea that labor was disgraceful is yielding to a more healthy public opinion, and a better day is fast approaching. Pecuniary embarrassments since the war have

retarded the introduction of improved machinery; but by the introduction of select seeds through the Agricultural Department, and better culture of smaller areas, much progress is being made. *Ashe*: Increasing use of mowers and horse-rakes. This is a grass county, and the farmers sow more and more clover and grass, and are improving their lands and stock. *Haywood*: Great improvement in the management of farms. Permanent barns and shelters are being prepared for stock, and the high table-lands seeded to grass for pasture. More and more attention given to saving and proper manipulation of manures for fertilization. Dairying is on the increase, and sustains one cheese factory, besides furnishing large quantities of butter for the southern market. *Craven*: Modern machinery, better fertilization and preparation of the soil, and still more by the determination to raise more hay and all home supplies, instead of importing them. *Stanly*: Compared with the condition of things ten years back, there has been visible progress. *Warren*: We have economized labor to considerable extent in the cultivation of cotton, especially by the introduction of plows, cotton-choppers, gins, &c. The experience of the last six years is beginning to change the policy of buying fertilizers and making cotton to the exclusion of other crops. *Stokes*: Slowly introducing labor-saving machinery; a few intelligent agriculturists settling among us; great improvement in the quality of tobacco; the land is peculiarly adapted to raising the finest quality, and can be bought at \$5 to \$10 per acre. *Randolph*: An increased reclamation of wet, swampy lands for several years, by putting in under-drains and ditches of proper depth. Several reapers and mowers and a few seed-drills have been introduced, but harvesting is generally performed with the old-fashioned cradle and scythe. *Pitt*: Efforts to systematize and economize our labor almost fruitless. A few individual examples have had a fine influence. *Robeson*: In some instances the yield per acre is much larger than formerly, and our people are beginning to learn the advantages of manuring and cultivating well. *Franklin*: The tendency is to cultivate less land, and improve what they do work and to diversify the products of the farm. *Davidson*: Increased use of labor-saving machinery.

SOUTH CAROLINA.—*Williamsburgh*: Better preparation of lands, better cultivation, and better implements. *York*: One planter says: "Twenty years ago, with thirteen laborers, my father produced on his plantation 12 bales of cotton; last year, with seven mules and about ten field-hands, I produced 96 bales on the same plantation." *Caldwell*: The people are awakening to the necessity of improvement, but have made but little. *Chesterfield*: The planters of cotton have made great advancement in the quantity of production per acre since the war, and as far as possible, with the labor and improvement, have reduced the cost of production. *Lexington*: Colored laborers are purchasing homes and devoting all their spare time to the improvement of the same. Their children, too, are going to school, and making commendable progress in their studies. *Laurens*: From the scarcity of labor, our people work less land, but manure it better, and raise more. *Barnwell*: The labor is about the same as since 1865, but farmers have learned to deal more economically with it, from necessity, and to raise a greater product per acre. *Greenville*: Boys are learning to plow and to mow; girls spin, weave, knit, wash, cook, and sew. There is more care taken in the neatness of working-costumes, substantial, home-made boots and shoes. The more nice dressing, the greater the desire to work for the means to purchase good clothing. The use of wheat-bread and butchers' meat is increasing.

GEORGIA.—*Harris*: Farmers more thrifty and less inclined to run in debt; laborers more disposed to hire by the year; more interest in fertilizers. *Jefferson*: Improved implements and fertilizers. *Decatur*: No improvement. *Catoosa*: No improvement. *Putnam*: Colored labor better; little work by white men, but when they have worked with economy and industry they have done well. *Early*: Freedmen doing much better; fruit-culture enlarging; farmers' clubs organized; agricultural papers more circulated. *Worth*: No improvement; few agricultural works read; follow the old ways. *Cherokee*: No improvement. *Dooly*: Medium grade of planters succeed best. *Douglas*: The results of the last three or four years of recklessness are inducing reflection. *Forsyth*: Improved implements, but not much improvement in labor. *Liberty*: Plantation system passing away; white men doing their own work; the new rule is small areas, thorough tillage, thorough fertilization, mixed husbandry. *Twiggs*: Labor more intelligent and reliable. *Upson*: Labor emigrating; more industry and application; more manures and better implements. *Schley*: Raise more for home consumption. *Bartow*: None. *Gordon*: Better fertilization. *Marion*: Less cotton and more grain. *Brooks*: Better understanding between employers and laborers. *Pike*: Marked improvement in preparing lands; this found to be economy of labor; freedmen largely emigrating. *Meriwether*: More grain-raising and manuring. *Dawson*: Some improvement in culture, and more in economy. *Carroll*: More grain. *Floyd*: Some improved implements and culture. *Johnson*: Tenants more industrious and economical. *Warren*: None. *Stewart*: Considerable reclamation of land.

FLORIDA.—*Columbia*: No improvement in farming; in fact we are making less per acre, and spending more in doing it, than we did ten years ago. The vast amount of timber and stumps on the land prevents the use of many of the labor-saving machines of modern invention, and consequently most of us are treading in the footsteps of our

forefathers. *Jefferson* : A little promise of improvement is visible in the fact that the laborers are more inclined to work for stated money-wages than heretofore, in which case the labor can be better controlled. A good sign, also, is the better care bestowed on fences. *Gadsden* : The only evidence of improvement in economy and efficiency of labor observable is to be found in the increased caution now practiced in the selection and employment of farm-laborers. *Orange* : This county is fast improving in consequence of the immigration from other States. *Levy* : There is no system used in either planting or cultivating crops. The same tools that were used a thousand years ago are still in use; and very little improvement in anything, though farmers are beginning to plant more oats, and less corn and cotton. *Santa Rosa* : The capital and industry of the county being almost exclusively confined to the channels of mercantile, timber, and lumber business, there is little to note under this head. This county is a principal source of supply to the port of Pensacola. *Madison* : Correspondents think that labor was more reliable the past year than in former years.

ALABAMA.—*Crenshaw* : Farmers are relying more on home-made fertilizers, and less on imported than formerly; they have found the latter greatly adulterated. *Bullock* : There are the most gratifying evidences of improvements; farmers and their families are retrenching their expenses of all kinds, and practicing the most rigid economy possible in all domestic matters; they are reducing their agricultural operations. *Saint Clair* : I notice our people are purchasing and using better implements than heretofore; many are engaged during the winter in making and saving manures; by this means, and by the use of improved seed, some are making twenty-five hundred pounds of raw cotton per acre, where formerly they got but seven or eight hundred. *Walker* : We have a colony of intelligent Englishmen and Northern men settling in the county, which is doing very much to systematize the labor. *Greene* : The preparation for putting in the next crop is much more general and thorough than is usual at this time of the year. *Henry* : I am very confident that the great failure of the cotton-crop of 1873 is now rapidly effecting a change for the better in our system of farming; less cotton will be planted, more of the small grains, and more thought and attention be given to every department of the farm. *Montgomery* : I may say in general terms that our system of labor is evidently improving; it is more reliable, and, therefore, more efficient; I have found the system of paying wages in money by the month the most satisfactory and attended with less trouble in the end. *Blount* : There is much improvement in economy and advancement in agricultural knowledge among our farmers, and if the means of applying their skill was possessed, a brighter era would dawn upon us; the negroes have nearly all gone to other regions, and their places have not been supplied; a large increase of our agricultural force by immigration seems to be the only hope for the future. *Perry* : The freedmen and laborers are more efficient in their duties than usual; more land has been cleared, more fencing done, and more ditching accomplished in the last two months than was done in any two years since the war. *Calhoun* : The principal improvement in farming is the procuring of better tools and implements of husbandry and the preparing of home-made fertilizers.

MISSISSIPPI.—*Hancock* : The great mass of colored people within the county have shown their good sense by obtaining, settling, and cultivating small homesteads. *Claiborne* : Very little more attention is being paid to manuring land, and to improved seed and implements. *Jefferson* : There seems to be a gradual awakening from our improvident habits. Labor is hardly more efficient than formerly. There seems to be a decided improvement in the mode of cultivation. *Jasper* : There seems to be some spirit of improvement in the county, manifest mostly in fencing and farming buildings. *Tishomingo* : The farmers of this county have advanced some in cultivating the soil, selection of seed, and husbandry of fertilizers. *Lauderdale* : There is no great improvement in the efficiency of labor, but there is generally an improvement in agriculture, more attention to fertilizers, and a reduction in the area of cotton; more small grain sown; more corn will be planted. "Grangers" have done much. *Newton* : Our labor is becoming more reliable every year. With improvements making in soil, implements, and seed, I hope for good results.

TEXAS.—*Bosque* : There has been considerable introduction of improved gins, cotton-presses, and other machinery; also of various patent fences. *Victoria* : The evidence of improvement consists in the introduction of improved implements, and more thorough culture, resulting in increased yield per acre. *Fannin* : Introduction of labor-saving machinery and payment of liberal prices for labor during the busy season instead of low wages for the whole year. *Laraca* : Better implements are being introduced, and a slight improvement in tillage. Greater breadth is given to oats and rye, but the majority of farmers do not deviate from the old routine of corn and cotton. *Montgomery* : Our farmers have found out that they must vary their crops, and during the winter a large area has been sown in choice grasses, barley, and rye for pasturage, and nearly all are now planting oats. *Waller* : The strongest evidences of improvement are larger food and forage crops, very materially lessening the cash expenses of the farm, increased interest in agricultural literature, greater care in the selection of field-seeds, the saving of manures heretofore wasted, planting of fruit-trees of

choice varieties, and the establishment of a large nursery. *Hamilton*: Our labor system is very crude and inefficient, and wholly inadequate to the demand. The labor is performed entirely by whites, there not being a dozen freedmen in the county. Farmers are introducing better breeds of horses, cattle, and hogs. *Grimes*: Most of our wealthy farmers rent their lands to freedmen by the acre, and feel no interest in the mode of culture so that they get their money. There seems to be a disposition to plant more oats for feed, to save hay, and to take better care of their stock. *McLennan*: The most rational process of planting and cultivating cotton which has come to my knowledge is as follows: Flat-break the ground, lay off the drills the usual distance with a narrow plow, drill in the seed as usual, and cover with a turning plow, harrowing afterward. When up check off with a "sweep" across the drills, two furrows with the sweep, making a middle this way as wide as the drill. The after-culture consists of one hoeing and continual use of the sweep, passing between the rows both ways. The advantage of this process is in saving labor with the hoe. *Bee*: Improved stock of all kinds being introduced, and barns and stables for shelter in winter being erected. At the close of the war there was not a single pasture inclosed in the county, but now there are about twenty, averaging 500 acres each. *Nueces*: There is a growing desire to purchase land and resist the encroachments of wandering herds of all kinds of stock, realizing the fact that a man is entitled to whatever benefit he can derive from his own land upon which he pays taxes. *Brazoria*: The negroes, who form the bulk of our laborers, are leaving the towns and villages and returning to their former pursuits of agriculture, and are paying more attention to the raising of breadstuffs and other provisions than heretofore. Many are securing homes and small farms, and have commenced the year apparently with the determination of doing better in the future. There is less idleness and drunkenness among them than at any period since their emancipation; and it is to be hoped that favorable crops and prosperous times will prevent a return to their former bad habits. *Hill*: I cannot claim that economy and efficiency of labor have accomplished any very remarkable results, but yet in the preparation and management of the land, and the proper direction of labor, there is much evidence of progress. The lands have been kept in better condition and freer from weeds, which evinces increased interest.

ARKANSAS.—*Franklin*: There is some advancement in economy, efficiency of labor, in systematic processes in advanced intelligence, and skill. This county lacks more in means than in skill. *Scott*: Ditching has been done in many parts of this county, causing lands heretofore unproductive to produce well. Attention is now being directed to fruit-growing more than ever before, both for market and home consumption. Cotton-planting is decreasing in amount, and grain, fruit-growing, and stock-raising is on the increase. *Stowe*: Considerable improvement in the preparation of the ground before putting in crops, by deep plowing and harrowing, the last year, with very satisfactory results.

TENNESSEE.—*Giles*: Less cotton and more grass; more labor-saving machinery. *Greene*: Improved wheat culture. *Fentress*: Not much. County has but partially recovered from the war. *Dickson*: Better implements and processes of culture; farmers' associations increasing. *Obion*: The best implements introduced. *Davidson*: More clovering; better plowing; diagonal plowing has produced excellent results, stopping the washing of land. *Dyer*: Freedmen averse to any crop except cotton, which brings ready money. *Cooke*: Improved implements and processes of culture. *Perry*: Farms subdivided; manure husbanded; more grass; more systematic rotation; better tools; more general discussion; more diversification of crops. *Wilson*: Improved machinery; scarcity of labor compels it. *Washington*: Considerable awakening and promise of substantial reforms. *Bedford*: More grass. *Blount*: Better machinery and improved processes. *De Kalb*: Smaller farms; better manuring; greater economy in labor. *Hancock*: Rotation more generally practiced. *Monroe*: Better implements and farm-buildings; better culture and more economical management. *Meigs*: Best farmers importing better implements. *Sumner*: Lack of labor has induced the general use of machinery; more systematic rotation; improved appearance of farms. *Robertson*: Improved implements and live stock, with a more judicious rotation; labor-system unsatisfactory. *Grundy*: A Swiss colony has set a noble example of recuperative culture. Few other farmers have got out of the old ruts; dilapidated buildings and farms, and general poverty of soil apparent. *Henry*: Labor-system unsettled; most of the laborers crop on shares, and change homes every year. Most of them make a support. *Jefferson*: Improved implements and processes of culture; more manuring. *Stewart*: Better houses and clothing; better stock under better shelter. *Sevier*: None. *Carter*: Less advanced than before the war. *Fayette*: None. *Loudoun*: Better machinery and more manure. *Polk*: Improving the fertility of lands; rough surface forbids the general use of machinery. *Bradley*: Farmers beginning to see the need of fertilizing. *Smith*: Improvements in stock, grain, and grass-raising. *Rhea*: Better implements; more grass. *Campbell*: Considerable improvements in machinery and in winter-stabling of stock. *Lincoln*: Considerable improvement in preparing soil for wheat and corn. *Hardin*: Labor system about the same, but more labor-saving ma-

chinery. *Coffee*: Very little. *Cannon*: Labor system imperfect; more manure saved. *Anderson*: None.

WEST VIRGINIA.—*Brooke*: Slow and gradual improvement in fencing, roads, bridges, &c.; none in methods of saving and increasing manures, nor in the draining of land. *Taylor*: None; labor demoralized, beyond what the farmer and his own family can do. *Putnam*: All our farmers show a marked improvement in the general introduction of farm-implements, the sowing of clover and grass seeds, and in the greater care of manure and other fertilizers. *Harrison*: None. *Mercer*: More attention given to the use of fertilizers, plowing under crops in a green state, and introduction of improved machinery. *Berkeley*: By the growing of young cattle for their manure and the introduction of mowing and reaping machines. *Upshur*: Very little. *Marion*: Great improvement in sowing of clover and timothy; our best farmers sow all their wheat-fields in timothy when they sow their wheat and cross it in the spring with clover. *Tyler*: Some attention given to rotation of crops and to clover and grasses, but the means are sparingly used. *Grant*: For want of a rational system our best farming lands on South Branch of the Potomac are being rapidly exhausted, as shown by the reduced annual yield. General introduction of labor-saving machinery. *Fayette*: Some talk of sub-soiling. *Boone*: Some rotation. *Cabell*: A few cases of intelligent soil recuperation. *Lincoln*: None. *Kanawha*: Some advancement. *Barbour*: None. *Tucker*: Producing more of our own bacon and flour. *Jackson*: Large amount of improved machinery introduced. *Morgan*: Improvements in fruit culture. *Wayne*: None. *Mineral*: Little or none. *Jefferson*: Some improvement visible.

KENTUCKY.—*Oldham*: Better machinery and higher inducements to skilled labor. *McLean*: None. *Logan*: Large increase of labor-saving machinery. *Hopkins*: Very little. *Shelby*: None. *Kenton*: Improved machinery; better preparation of soil for crops. *Jefferson*: Considerable extension of market-gardening by new settlers. *Henry*: Very little; farmers run too much in the old ruts. *Adair*: Farmers hold too much land. *Scott*: Freedmen will only work by the day, and hence are not to be depended on for cropping; they are anxious to become land-owners and labor for themselves. *Mercer*: None. *Spencer*: Increased use of labor-saving machinery as labor declines in effectiveness. *Johnson*: A small improvement in fruit-raising. *Lincoln*: Slow and steady improvement of labor. *Lewis*: The establishment of manufactures over this county, comprising seven saw-mills, two stone mills, spoke, hub, stave, barrel, and cooperage manufacturies; six new turnpike-roads, two railroads in operation and a third organizing; six new churches and twelve new school-houses. Two-thirds of the capital and seventy-five per cent. of the mechanical labor came from abroad. Since the abolishment of slavery the population and resources of this county have doubled. *Metcalf*: More bartering of produce for groceries. *Daviess*: A partial abandonment of the old system; old lands are brought back to usefulness and a systematic rotation generally adopted. *Russell*: Farmers here follow in the steps of their fathers; never manure their land; plant in corn and tobacco as long as it will produce anything, then clear up more land and treat it in the same manner, until all the land is completely exhausted, then sell out if they can, and if they cannot, leave all behind them and go west. At least one-third of the lands in this county are worn out and turned out to grow up in briars and bushes. *Breckinridge*: A few young farmers are progressing. *Boone*: None visible. *Meade*: Farmers are working harder, saving more manure, and getting all the improved machinery they can purchase. *Graves*: Some organizations for improvement, but no tangible results as yet. *Hart*: No results as yet; some efforts to secure improvement by organization. *Livingston*: None.

OHIO.—*Pickaway*: The best farmers in the county have reduced the cost materially of raising their principal staple, corn, by using improved implements, especially the so-called breaking-plow. *Shelby*: Improving the land by under-drainage with drain-tiles. The low grounds of the county being the most productive, their value is enhanced and productiveness increased by a systematic and thorough drainage. *Finton*: A few farmers have commenced plowing their fallows for wheat in June, and seeding with the drill instead of the old mode of plowing in September, and sowing broadcast and harrowing in. We find by the former mode we can raise from 50 to 100 per cent. more than by the old mode, and only 75 per cent. of seed to the acre is used. *Champaign*: The employment of more farm-machinery, and a cultivation of less area, and doing it in a more thorough manner, the high price of labor and produce forbidding the hiring of more help. *Tuscarawas*: Some improvement in field-culture, and closer economy in saving crops; more home comforts and better farm-implements; farm-labor declining in effectiveness. *Marion*: Much draining and under-draining of later years; better breeds of live stock, especially Norman horses. *Licking*: Some improvement in implements. *Franklin*: Most of the hard work done by machinery. *Highland*: Backwardness in introducing machinery and in saving manure; too little clover. *Williams*: No facts of interest. *Warren*: Gradual improvement each year; wonderful advance compared with twenty years ago; better implements and processes of culture. *Medina*: Dairying greatly on the increase, so that few raise grain to sell. Less sneering at "book-farming" than formerly; greatly increased circulation of agricultural journals

Madison: Nothing remarkable. *Logan*: Increased desire for improved farm-implements. *Hardin*: Great numbers of farm machines; sales increasing every year. *Ashland*: Crops put in in better style; great extension of machinery. *Geauga*: Gradual improvement for years; farmers' clubs and other organizations; great advance in agricultural intelligence. *Lorain*: Great improvement within three years, especially in draining and in general economy of work; but little waste; some farmers formerly wasted more than they now feed. *Fayette*: Great improvement in implements. *Sandusky*: Improved machinery. *Meigs*: General use of improved machinery. *Lucas*: Improved machinery, under-draining and tree-planting by roadsides. *Morgan*: Mixed husbandry; more live stock fed on the farm. *Hancock*: Most of the labor done by machinery; under-draining; improved rotation; protecting birds. *Adams*: Better tillage and more thrift. *Carroll*: Improved machinery and economy of labor. *Hamilton*: More judicious rotation and selection of crops. *Richland*: More labor-saving machinery, and consequently more leisure for mental culture. *Butler*: Increased economy of labor, but not any more efficiency in labor itself; no observable increase of intelligence or skill in farming. *Delaware*: Thousands of acres drain-tiled every year, bringing into cultivation the swampy lands; increase in economy of labor, if not in farming skill.

MICHIGAN.—More labor accessible on account of stagnation in lumbering enterprise. Farmers too prone to loan their money at interest. *Ottawa*: Many are purchasing labor-saving machines. *Oakland*: Increased economy of labor; arrangements have been made which enable one man to take care of double the amount of live stock. *Branch*: Steady improvement. *Van Buren*: Increased economy of labor; increased cereal productions. *Gratiot*: Increased tile-draining. *Kalamazoo*: Great changes in twenty years. *Macomb*: Improved machinery. *Shiawassee*: Improved machinery and more systematic rotation. *Mason*: County new; land cleared and seeded in grass as fast as practicable. *Cass*: More and better farm-implements; improved buildings and more intelligent care in selection and treatment of animals; wind-mills extensively employed to raise water for live stock. *Ionia*: Contrary to our ancient custom, we now raise clean wheat; our cultivated crops are in the main attended to; our domestic animals are much improved and better cared for; valuable fruit-trees have increased in number and are much better cared for; our fences and buildings are made more substantial and convenient; grass-seed is sown on fields that used to be bare; many of our farmers are free from debt, and have something ahead. Much has been and is being done in the way of draining, manuring, and clearing the fields of stumps, stones, and other rubbish, and the plow is going down deeper and is doing much better work. *Lenawee*: Last year 1,000 bushels of corn were raised in this county on 20 acres of land at a cost of \$334.40; the crop brought 80 cents per bushel, or \$800 less the total expenses of \$334.40, leaving a profit of \$465.60. *Washtenaw*: Systematic rotation of crops; the use of plaster as a fertilizer, and the extensive use of manures, indicates the advance of the past ten years.

INDIANA.—*Randolph*: Farmers are taking more pains in putting their ground in order and manuring more than heretofore. Greater attention is also paid to introducing improved farm machinery. *Greene*: None. *Switzerland*: Our farmers are now realizing the damaging effect of the continually cropping and exporting of hay and the close selling of nearly all the straw raised. The exhausted condition of the lands from selling off all the hay and straw has had the effect of turning the attention of the farmers to a more systematic manner of farming. *Union*: Draining the soil, improved labor-saving machinery, the introduction of thoroughbred short-horns, and Cotswold and merino sheep, are among the improvements. *Knox*: A more thorough preparation of the soil for the reception of the seed, a more general use of fertilizers, and a general alternating of crops. *Martin*: Farmers are taking more interest than formerly in their business. *Harrison*: The saving and application of barn-yard and special manures, and the introduction of more labor-saving machinery. *Daviess*: None. *Marion*: More care in the preparation of the ground, putting in their crops at the proper time, the judicious selection of seeds, and attention to improved breeds of stock and their proper care. *Putnam*: Our farmers are intelligent and economical, but rather conservative. *La Porte*: There is a general waking up as it were to the necessity of curtailing expenses and doing business on a strictly cash basis. *Brown*: Some of our farmers are sowing down most of their land in clover and grass, and turning their attention to stock-raising. *Fanderburgh*: None. *Miami*: Marked general improvement in roads and farms. *Noble*: More machinery; most of the grain thrashed by steam. *Howard*: Improved culture; more reading of agricultural journals. *Tipton*: Better improvements. *Warren*: Gradual improvement in scientific culture. *Steuben*: A spirit of improvement; some draining. *Fountain*: Some improvement in farm and stock management; shelter and feed better. *Jennings*: Saving in corn-culture by the corn-drill and double-plow. *Gibson*: More economy in management. *Washington*: Improved machinery. *Union*: Draining and labor-saving machinery. *Rush*: Great results from machinery. *Madison*: Very little. *Randolph*: Better tillage. *Franklin*: Increased yield through drainage and better tillage.

ILLINOIS.—*De Kalb*: Great increase in labor-saving machinery. *Franklin*: More general rotation of crops. *Cass*: Improved machinery, culture, and economy. *Ogle*: Improved machinery; wind-mills for watering stock. *Effingham*: Rotation of crops; feed more produce on the farm. *Crawford*: Rotation and better tillage. *Rock Island*: Better tillage. *Henderson*: Improved implements. *Tazewell*: Better stock and seed; more grass-crops. *Putnam*: Increased attention to rotation. *Henry*: Increased association of farmers; better machinery. *Ford*: Mr. Sullivan farms 40,000 acres on an improved tenant-system with good results. Tenants pay a rent of two-fifths of their produce. His own farming is excellent. *Clarke*: Improved machinery and more careful plowing, putting in of seed in a better manner, the greater extension or more general use of clover, a more careful economy in the application of manures, and a general interest manifested by farmers as to the best and most approved modes of agriculture. *Hancock*: A marked tendency toward the improvement of stock is manifested; also more attention to fertilization; clovering, manuring, and rotation of crops. *Saint Clair*: Better tillage. *Boone*: An inclination to raise more stock and less grain, thereby saving considerably for hired help. *Monroe*: It is seen in the increased number of good machines, in soiling, clovering, and manuring; in the increasing quantity and quality of the different crops. *White*: Better implements; more clovering. *Sangamon*: The proper preparation of food for cattle, and the erection of suitable accommodations for poultry, and the introduction of improved breeds. *Mason*: This was originally known as a corn-producing county only, but it is observed that where corn had been planted on stubble-timothy or clover ground (the latter the best) there has been from 20 to 40 per cent. gain in the crop of corn, both in yield and quality. *Edwards*: Better farm-houses, barns, and shelter for all kinds of stock, that are being erected; also better market facilities. *Wayne*: More attention generally paid to rotation of crops, proper cultivation, and more careful about going into debt than heretofore. *McLean*: Working more themselves, and hiring less help; another indication is the increased subscriptions to agricultural newspapers. *Menard*: Increased care in the saving, preparation, and application of manure, and in alternating crops of grain and grass. *Randolph*: More attention to rotation of crops, using more clover-seed, plowing in swards in last of July and first of August; the use of improved implements, whereby one man can perform the labor of two. *Fayette*: Gradual increase of machinery. *Clinton*: Better shelter for stock; more economy; improved implements. *Carroll*: Better breeds of live stock, unusual experiments at rotation, better implements. *Piatt*: Better tillage and tools. *Vermilion*: Better machinery and processes of culture. *Richland*: More general use of machinery. *Pope*: More thorough culture; better tools. *Marion*: Very little. *Hancock*: Marked improvement in live stock, also in fertilizers, but not much of increased science or skill. *Winnebago*: More stock fed; more grass and clover; better implements. *Livingston*: Farmers working more themselves. *Mercer*: Progress constant, but gradual.

WISCONSIN.—*Lafayette*: Better tillage and increased yields per acre; better implements and greater economy in management. *Washington*: More clovering, with satisfactory results. *Pierce*: General improvement in circumstances of farmers. *Milwaukee*: Most of the farmers foreigners; no improvements. *Fond-du-Lac*: Greater economy and more association. *Dodge*: Clovering, soiling and sheltering animals; more careful observation of results. *Keaupee*: Great improvement in machinery, culture, and economy. *Juneau*: None. *Jefferson*: More stock-raising, dairying, cheese-factories, farmers' clubs, &c. *Jackson*: Smaller farms, more profitable culture. *Columbia*: Great improvement in machinery and skill. *Dane*: Great improvement in live-stock, less grain-growing, more intelligent treatment of economical questions, more farmers' clubs. *Dodge*: Sowing clover, plaster and salt with small grain, providing comfortable quarters for all kinds of stock, cutting clover for hay early, and plowing in the after or late crop for purposes of fertilization, careful noting of results following experimental operations. *Douglas*: A spirit and evidence of a closer, better, and more thorough cultivation of small tracts, rather than a skimming over of large tracts. Cultivators are beginning to avail themselves of the advantages of deep plowing, good ditches for draining, and the free use of manures. *Calumet*: Improved machinery, deep plowing, green manuring, underground drainage; also the evidences of advancement in the intelligence and skill, in the more general prosperity of our farming population, their increased crops, and superior grades of stock. *Vernon*: More attention is paid to the raising of stock, and seeding in of clover and grass; the necessity of preserving the fertility of the soil is beginning to dawn upon the minds of our farmers. *Wood*: None. *Green*: The introduction of agricultural machinery, and the ability of the farmer to make proper use of it; the use of horse-power in the cutting of wood.

MINNESOTA.—*Houston*: The cost of the harvest, owing to high prices of labor and harvesting-machines, &c., is the principal drawback to the profit of grain-raising here; we have been paying \$200 for a machine that could be manufactured for probably \$120. Some farmers fail to raise oats and corn enough to feed their stock. Last spring I sold 1,200 bushels of corn, mostly to farmers. *Isanti*: There is a cry of hard times when, by a judicious outlay for machinery, a saving of at least one-half paid for labor might

be effected. One case in point: Mr. A., a number of years ago, was always in the habit of putting up about 100 tons of hay. This took four men for a period of four weeks, at a cost of \$130 and board. This year he put up 118 tons, using a good mower and steel-tooth rake, with two men and one boy, in a period of two weeks, at a cost of \$48 and board. Of course his team was engaged all the time, but in the former case his team was engaged half the time in stacking. *Dodge*: Harvesters are used to a great extent, and many farmers secure a wheat crop of from 1,000 to 1,500 bushels with the ordinary help required on the farm the season through. *Watouwan*: The method is the most slovenly imaginable. Wheat follows wheat year after year, in some cases for fifteen years in succession. All the improved farm-machinery is used, for which the farmers go in debt, and when not in use let it "lie around," so that by the time it is paid for it is worthless, and again go in debt for more. Many of the first settlers are selling out, and their places are being supplied with a better class of farmers. *Waseca*: The use of harvesters for cutting grain and mowers for cutting grass saves not only 100 per cent. in labor, but more than that in expense; and then plowing early in the fall and plowing deep in ridges, and sowing early, increases the crop nearly 50 per cent. *Sibley*: No farmers here, only robbers of the soil. *Fillmore*: Gradual improvement every year. *Chippewa*: Less machinery bought of agents. *Douglas*: More rotation; mixed husbandry; farmers' clubs. *Martin*: Improved tillage. *Jackson*: Economy of labor; more machinery. *Le Sueur*: Nothing important. *Sherburne*: More attention to manure. *Noble*: None. *Crow Wing*: More culture on less land.

IOWA.—*Cherokee*: Improved harvesters and corn-planters. *Tama*: Improved harvesters. *Hancock*: None visible. *Audubon*: Too much in the old way. *Hardin*: Better shelter for live stock; increased fruit-culture; better implements. *Buena Vista*: Very little. *Buchanan*: Progress slow. *Jasper*: More economy; labor becoming more intelligent and reliable. *Guthrie*: Labor-saving machinery. *Allamakee*: Improved tillage and general intelligence. *Jackson*: Grinding and cooking of grain fed to stock. *Pocahontas*: Increased amount of machinery; too often bought on credit. *Kinggold*: None worthy of mention. *Mitchell*: Efforts to introduce mixed husbandry; more attention to stock-raising; dogs still restrict sheep husbandry; cheese-factories are springing up very numerous. *Calhoun*: The community are beginning to buy more on the cash principle, and they therefore buy more sparingly; they are beginning to seek and to get the best kinds of seeds and improved stock. *Fayette*: There has been some improvement as regards the rotation of crops. *Taylor*: A strong effort being made to get out of debt, and do on less until things are paid for. A greater degree of attention paid to the cultivation of the different grasses and fruits; comfortable dwellings and barns are springing up throughout the county. *Jefferson*: A greater care is manifest to keep land in a good condition. Farmers begin to realize the fact that something must be done to maintain the fertility of the soil, and there is an effort made to feed as much as possible of what is raised upon the farm. *Jackson*: Grinding and cooking the grain fed to cattle and hogs, and also the cooking of many of the bulbous roots before feeding. The practice is also being adopted of saving and applying fertilizers to the land. *Bremer*: Perhaps in no ten years (prior to the last two) of the world's history have those engaged in agriculture made so much advancement in knowledge relating to the business affairs of life. *Floyd*: A strong evidence of advancement is from the fact of farmers turning their attention more to the raising of stock, in place of continually raising wheat. *Carroll*: The more general introduction of new and improved implements of agriculture. *Iowa*: Improved machinery, rotation of crops, and better and more systematic cultivation; also the purchase and introduction of improved stock. *Grundy*: But little advance is shown. The farmers burn their straw, to get it out of the way for the next crop.

MISSOURI.—*Caldwell*: The great increase of agricultural papers, which are freely subscribed for and read, and the remarkable increase in numbers of the patrons of husbandry. *Gasconade*: A growing disposition to substitute horse-power for human muscles; the better cultivation of the various crops, including manuring, plowing, and harvesting; better system of rotation, and a more general adaptation of the means on hand to the ends in view. *Lawrence*: An effort to cultivate the same amount of ground in a better manner, raise more grain to the acre, &c.; also an attempt to secure the productions of the soil in a better shape than formerly; the building of better barns and farm buildings generally. *Clinton*: A desire to use improved machinery and to cultivate less land, and to produce the same amount of crop. *Washington*: Much attention has been paid to barn-building for the protection of stock and safety of farm-products; manures are carefully saved and judiciously applied, and interest is felt in the procuring of the best fertilizers for renewing worn-out or exhausted land. *Reynolds*: But little systematic farming; there is not a single seed-drill in the county. *Dallas*: From the appearance of the farms it is evident an advance has been made; there is more system and skill displayed in farming; the farmers are beginning to realize the fact that there is something more than hard work necessary to successful farming, and for this purpose they are using their brains more. *Davies*: Much of our wheat is put in with a drill and rolled afterward, and it is nearly all cut with reap-

ers. The only fertilizer in use among us is obtained from the barn-yard. *Osage*: The ground is plowed deeper, and better pulverized, and full crops sown earlier; the use of the drill for seeding is more used. *Callaway*: An increasing determination to get the best farming tools, to facilitate work, and to economize labor. *Lincoln*: I have noticed farmers are becoming more careful of their straw, ricking it up in good order for winter use; and the better farmers have built barns, sheds, and other places of retreat for stock in inclement weather; also a desire is manifested for a better and more improved class of stock by purchasing of the best known breeds. *Pettis*: More labor on less land has become the motto of many of our farmers; and manure, but little noticed a few years previous, has during the last season come extensively into demand, and ere long will be an article of commerce. *Mercer*: At present almost every farmer plows his ground well before sowing, then puts it in with a wheat-drill, and the result is that an acre of land thus treated now produces more than three acres under the old system of broadcast sowing and afterward dragging a brush or harrow over it; in this way the frost destroyed much. *Livingston*: Improved machinery and breeds of live stock. *Franklin*: Cleaner culture; less land under plow; better machinery; more and better agricultural reading. *Phelps*: Eastern farmers are trying to introduce rotation. *Howard*: Very unsatisfactory. *Carroll*: Improved implements enable one man to cultivate well fifty acres of corn, double the former ratio. *Nodaway*: Improved stock, tools, and methods of culture. *Jackson*: Improved machinery. *Taney*: None. *Stoddard*: Improved machinery. *Ripley*: Improved machinery and tillage. *Ballinger*: Improved machinery. *Callaway*: Unreliable labor remedied by getting the best implements. *Cape Girardeau*: Some improved machinery. *Stone*: Unreliable labor has compelled economy. *Saint François*: None. *Pulaski*: None visible. *Newton*: None. *Wright*: Better tillage. *Saint Clair*: Better rotation. *Douglass*: None. *Christian*: Some new machinery. *McDonald*: None. *Ray*: Not very decided. *Polk*: Only in isolated cases. *Harrison*: Improved machinery. *Clay*: Very little. *Boone*: None. *Audrian*: None. *Rails*: None. *Iron*: Slow and gradual.

KANSAS.—*Doniphan*: A decided improvement in all kinds of machinery, seeds, stock, &c. *Ellsworth*: A great improvement in stock by crossing the native and Texas cattle by thoroughbred Durhams. *Nemaha*: The best variety of seeds are sought after; animals for the improvement of stock have been bought at a high price and introduced into different sections of the county; grain is better protected, and straw better secured and made available for feed and manure. Orchards, groves, and vineyards are being planted. *Jackson*: The most economy is apparent in feeding their grain to stock, thereby driving their crop to market on foot. *Washington*: The introduction of sheep, and a more mixed husbandry, the making of cheese, and the use of new and improved farm-machinery. *Wilson*: New and improved machinery, and the use of the drill particularly. *Chase*: More corn raised than usual, and therefore more cattle and hogs fattened; and instead of sending two and three year olds to Illinois, we keep them at home, fatten them ourselves, and send them to market as beef-cattle. *Bourbon*: Greater variety of crops. *Lyon*: Better implements: more manure saved. *Cowley*: Better tillage. *Reno*: Better implements. *Howard*: None. *Republic*: A few save more manure. *Sedgwick*: Farming a more settled business. *Linn*: Not worthy of note. *Labette*: Improved machinery. *Clay*: Improved machinery. *Morris*: Improved machinery and a better kind of labor. *Brown*: But little as yet. *Cloud*: Nothing special. *Riley*: Very little. *Jefferson*: Improved machinery has enabled farmers to hold their own through the panic. *Marshall*: Improved culture, machinery, and economy. *Butler*: Better culture and machinery. *Atchinson*: Farmers gaining wealth.

NEBRASKA.—*Lancaster*: Improved machinery. *Merrick*: Grain-drills. *Webster*: Improved machinery. *Antelope*: Great efforts to secure the best implements; county newly settled. *Nemaha*: Combining for the purchase of implements. *Otoe*: Gradual, yet perceptible progress. *Madison*: Great efforts to secure best machinery. *Burt*: Increased use of "headers" in harvesting; great saving thereby. *Jefferson*: We are testing the best ways of getting the best yield for the least labor. *Cass*: There is but little system, efficiency, or economy of labor practiced here. Every one pursues such a course as he thinks will pay him best with the least labor. If a man does not sow from 60 to 80 acres of small grain, and plant and cultivate from 40 to 50 acres corn, all with one team, he is considered as doing a small business. *Gage*: Orchards are beginning to spring up in all directions, and stock-raising to consume the spontaneous productions of the pastures. These are prominent evidences of advancement. *Richardson*: Our farmers have commenced building barns to save fodder and grain; also they have begun to use improved machinery. *Cedar*: A tendency toward a rotation of crops and the use of domestic fertilizers.

CALIFORNIA.—*Klamath*: Improved machinery. *Santa Clara*: Many of our practical and intelligent farmers have commenced summer following their lands, the yield being from 25 to 30 per cent. increase. The soil of this State, particularly of the valley lands, can only be successfully cultivated in this way. *San Diego*: We have all the modern improvements, and are endeavoring to farm systematically, and with due

economy. *El Dorado*: Not much. *Amador*: The most marked improvement is the method of dry sowing; the ground being plowed and sowed during the three or four months following the harvest, or before the winter rains have made the ground soft, the grain remaining dormant the while. By this process a large area of land is put in before the winter rains have softened the ground. It is believed this method has advantages over summer fallowing; inasmuch as the first rains cause the ground to become exceedingly mellow, while not unfrequently summer fallow is rendered hard and clammy by the late spring rains. *Lake*: But little. *Contra Costa*: The use of improved machinery, also improved methods of tillage, rotation, manures, and adaptation of crops to conditions. *Tuolumne*: None. *Douglas*: A greater desire on the part of farmers to obtain accurate information in respect to their calling; hence, the agricultural papers are being freely subscribed for and read. *Stanislaus*: Little or none.

OREGON.—*Josephine*: None. *Douglas*: Little or none. *Lane*: Large use of grain-drills and gang-plows. *Wasco*: Improved breeds of live stock. *Linn*: Great improvement in wheat-culture; the drill becoming common.

NEVADA.—*Esmeralda*: Not far enough advanced to have much improvement.

TERRITORIES.—*El Paso, Colo.*: There is a general and manifest desire for improved methods of agriculture, and for that which will most develop and advance the interests of farmers. *Weld, Colo.*: As an evidence, we have organized a territorial stock-growers' association, with auxiliaries in each county, for the protection of the stock interest, with a system of "round-ups" each spring, which greatly facilitates the handling of stock, and finding of strays. We are also improving our system of irrigation, and acquiring more system in farming under that system. *Douglas, Colo.*: The greater care of stock, and the introduction of improved breeds. *Box Elder, Utah*: Labor-saving machinery has relieved the farmer from bondage, and given him time to improve in intellectual culture. There is an improvement in building, field and garden culture, securing good breeds of stock, and also connecting various branches of home manufacture with farming. *Rich, Utah*: We are distant from a market, and have not much to sell, and cannot, as yet, procure the most economical means, to any extent, for building up or improving; still, we are fast advancing, all things considered. *Iron, Utah*: Drilling has proved to be a saving of one-third the seed, and an increase of from five to ten bushels per acre. *Taos, N. Mex.*: None whatever; our people are a long ways behind the present progressive age; the old plow is used in all cases; they never pretend to fertilize their land by manuring or otherwise, but depend solely on irrigation for supplying the deficiency in the fertility of the soil, and yet, with all their primitive manner of pursuing their avocation, they reap yearly golden harvests of all kinds of grain. *Doña Ana, N. Mex.*: The few American farmers here use plows purchased in Saint Louis, and a marked improvement appears in the productiveness of their land, and the destruction of the noxious weeds. Mexican labor is cheap and unskilled, and great difficulties are found in inducing the laborers to learn to use the labor-saving tools; still, a marked improvement is apparent among them, as they are brought into contact with the American farmer. Considerable skill is shown by some enterprising Americans in growing grape-vines, whereby the yield has been nearly doubled over the Mexican method. *Santa Ana, N. Mex.*: Labor is the same as it has been for the past fifty years; the Mexicans do not improve much in making labor as easy as possible. *Walla Walla, Wash.*: Farmers are building better dwellings and larger and more convenient barns, and are also building comfortable public school houses at almost every cross-road. *Lincoln, Dak.*: Much has been saved by the proper use of the various kinds of farm-implements, seeders and harvesters particularly. The land in this county is all new, the most of it having had only two crops taken from it. *Missoula, Mont.*: The land here being new, and naturally very productive, no particular system has been adopted.

• PRACTICAL RESULTS OF ASSOCIATION.

The March returns contain many facts illustrating the saving resulting from co-operation the past year in purchasing supplies or selling products; the advantage derived from association in "extending" or manufacturing raw products, the accomplishment of which could not be undertaken by single individuals, as in flour-milling, pork-packing, wool-working, butter or cheese making, and similar enterprises. These statements lead to the belief that many millions of dollars have been saved to the farming interest by the simple initiation of union for protection, a beginning of what should result not only in greatly enlarging the va-

riety and profit of rural labor, in a larger reliance for cash receipts upon products of high value in proportion to weight and cost of transportation, but in simplifying and reducing the cost of necessary exchanges, and disseminating progressive and beneficent ideas in agriculture. The gradual reduction of prices from the war-rates which prevailed a few years ago, with the accompanying necessity for retrenchment year by year becoming more imperious and threatening, has compelled a thoughtfulness, a spirit of inquiry, a discovery of burdens and crushing evils, and a search for a remedy, which has led inevitably to association and combination by societies, open and secret, rural clubs of various kinds, all animated by the purpose of obtaining relief. It is only a phase of the mighty impulse that is moving for the elevation of labor and its protection against the aggressions of organized capital throughout the world. It was logical, if not inevitable, that the movement should reach the great foundation-interest in productive industry, so extended and so isolated, after rather than before its organization of the various forms of artisan labor in the great centers of population.

In the New England States there is scarcely life enough in agriculture, overslaughed as it is by the magnitude and wealth of other industries, and depleted by emigration to richer soils, to originate associative effort; yet an active interest has been aroused in many places, and practical results have followed. Co-operative dairy enterprises, hitherto almost unknown in this region, are multiplying, especially in Maine and New Hampshire; and in Massachusetts a strenuous but not yet successful combination has been initiated against the gigantic and fraudulent monopoly of the milk-supply organized by dealers and sustained by railroads. In some portions of Massachusetts agricultural machinery is now purchased directly from manufacturers at a saving of 30 per centum, and the avoidance of the intervention of middle-men in purchases of nursery-stock has saved 33 per centum. In Vermont, something has been done in wholesale purchases of corn and other supplies from the West, saving 10 to 15 cents per bushel in corn, and a dollar per barrel in flour.

* In the Middle States there is evidence of greater activity of the associative idea, and some beneficent results have already been achieved. A few extracts will illustrate the direction of the effort:

NEW YORK.—*Allegany*: A saving of 20 and 30 cents per bushel upon corn has been made by co-operation in buying by car-load or boat-load. The manufacture and sale of cheese is also effected to advantage by combined effort. *Ontario*: Probably from one to three thousand dollars was saved by grape-growers combining in shipping their fruit as freight, instead of expressing in detached lots. *Otsego*: Co-operation in sales of cheese have saved to the farmer $1\frac{1}{2}$ to 2 cents per pound, equal to the amount paid for manufacturing.

NEW JERSEY.—*Cumberland*: Co-operation has not benefited the farmers in this county, except in the purchase of their guano last fall for wheat; by combining they were enabled to get their guano at wholesale prices, and it is thought saved \$5 per ton. In the township of Fairfield, the farmers and some other citizens have put up a co-operative canning establishment at the village of Cedarville. *Sussex*: Some years ago the cheese-factories or creameries were started on the co-operative principle, but that has been abandoned, the farmers preferring to sell their milk at a fixed rate, and to allow the men who run the factories to make the profit or suffer the loss as the case may be. As a general rule the farmer selling milk gets the price of a pound of butter for every twelve and a half quarts. *Camden*: By co-operation, vessel-loads of fertilizers are purchased, at a saving of about \$5 per ton.

PENNSYLVANIA.—*Lehigh*: There is no necessity for co-operation in this county; there is always a ready market for products, and ample chance to purchase supplies. *Cambria*: A cheese-factory is about being started on a small scale to manufacture the milk of 70 to 100 cows into some German style of cheese. *Bucks*: The milk-producers in this county are about forming a combination, with a view to selling and delivering their own milk. *Lebanon*: We have one establishment for preserving eggs. The

building is a three-story stone house, 50 by 80 feet. The two lower stories are each 7 feet high, and are intended for the eggs: the upper story is 11 feet high, and is now filled with ice tightly packed, holding about 1,000 tons; the second and third floors are not tight, permitting the cold from the ice to descend. The walls are $2\frac{1}{2}$ feet thick, lined inside, and filled in 1 foot thick with sawdust. The capacity is about 5,000 barrels. The eggs are purchased during the summer, and preserved packed in oats to ship for winter use. Eggs from Ohio are the best, bringing a cent per dozen more than any other, having a larger proportion of yolk than others. Those of Pennsylvania and Indiana are the next best. The eggs are all shipped to the New York market. *Washington*: Being convenient to market, and having access to many points for tools and machinery, are two reasons why a system of co-operation has not been adopted in this county. Another is the diversity of agricultural industry. This is a grazing county. There are 427,000 head of sheep, 30,000 head of cattle, 12,000 head of horses; 1,862,000 pounds of wool and \$870,000 worth of beef are produced; 450,000 bushels of wheat, and 67,000 tons of hay are produced from 410,000 acres of improved land, supporting a large population of mechanics, miners, and manufacturers.

In the Southern States the rule of individuality has been too predominant heretofore to admit of associated effort, but the idea is now entertained in many a southern community, and the reason is anxiously sought why mines are not worked, the grasses of mountain pastures utilized in dairying, a home supply of bacon and lard provided, an abundance of beef and mutton supplied, and twice the amount now realized in agricultural products easily obtained from a fertile soil and fructifying climate. The fact is beginning to be seen—though few as yet perceive the truth—that all the cotton which the world will take will never aggregate one-fifth the sum which should represent the agricultural production of so large a population and so fine a soil and climate as are found in the cotton States. Not that there should be less of cotton, but more of all things else; far more produced by the present amount of labor, and far more labor employed that is idle or worse than useless. The labor of the negro, when left to his own control, is often next to worthless, but usually efficient when intelligently and wisely directed by the farm proprietor. The association of a sagacious and sensible planter as manager, with labor represented by former slaves, has never failed of the best results. But there is a form of “co-operation” which has been a curse to this region—the aid extended to the landholder by the merchant who advances money and goods on the security of a lien on the crop, taking a mortgage at ruinous interest on the possibilities of the year’s income. As a correspondent expresses it, the beneficence of this aid is seen in purchasing pork at \$5 per hundred and in selling bacon to the planter at \$15. There is a tendency in many parts of the South to introduce the manufacture of cotton-yarn and cloth from cotton, machinery for wool-working, and various other enterprises in the extension of the raw material of agricultural production. Cotton-manufacturing especially has been found more profitable, perhaps, than in any other manufacturing region. Not only is the cotton there, but unemployed labor needed for its manufacture, and an open market for the goods manufactured.

The following extracts are selected from returns:

VIRGINIA.—Botetourt: Farmers are beginning to organize for co-operation, and I think that they have intelligence enough to sell their own produce to consumers and shippers, and thereby save the very large amount that now goes into the pockets of the middle-men. The fine flour-mills are kept constantly in motion. A large amount of flour is shipped from the county to the eastern markets. *Campbell*: To carry successfully an association of this sort requires more or less ready money, and this but few of the farmers have. Most of them about a year behindhand, and depend upon their commission-merchants to advance upon the growing crop, in order to obtain groceries, fertilizers, &c. *Prince William*: Some two or three years since there was an organization, called the Piedmont Produce Association, formed for co-operation, which promised great results; but after trial it did not give satisfaction to the people of the county, and it was abandoned. *Craig*: There has been no co-operative association the last year. One has recently been formed, but its fruits are yet to be developed. *Patrick*:

No benefits have resulted from co-operation except from the sale of brandy, and that so small as hardly to be noticeable; our citizens consume what they make. The small quantity of wheat grown is consumed at home. *Lee*: Our farmers are woefully deficient in any concert of action in disposing of their agricultural productions or the purchase of their yearly supplies. The raw material is not worked up in this county beyond the demand for home consumption. The pork, grain, and wool are sent chiefly in flat-boats down the river to Chattanooga; the pork and horses find their outlet to the east, being sold in North Carolina and Eastern Virginia. The cattle are driven to the blue-grass part of Kentucky while they are young. *Goochland*: Many of our people have been materially assisted by the co-operation of merchants, who sell them seeds, fertilizers, &c., on the faith of their crops, to be consigned to them for sale at maturity. By this arrangement much has been saved which otherwise could not have been realized. *Fairfax*: An association of farmers, known as the Richmond Milk and Produce Association, was organized two years ago. An agent was appointed in Washington to receive and sell the milk to retail dealers, and return the cans. Under discouragements which more or less always attend new enterprises, though some were peculiar to this, the association has steadily prospered in strength and usefulness. The great want is direct railroad communication with Washington by a "truck" train at night, so that milk, fruit, and vegetables prepared one day will reach the consumer the next morning. For milk there should be some other mode of reaching the consumer than through the retail dealers. They generally sell at a hundred percent. advance on cost. Many of them then make another profit, by skimming or watering, sometimes both, thus defrauding the consumer, and doing great injustice to the dairyman, upon whose shoulders a good part of the opprobrium is thrown of bringing to market an inferior article. A rigid inspection of milk is of service, but I know of no adequate remedy for the evil complained of, except by the organization of associations in the cities, who, through their agent, could buy directly from the agent of the farmers. *Albemarle*: About twelve months ago five farmers, in the immediate vicinity of Charlottesville, organized a co-operative club, calling it the Belmont Farmers' Club. From the success of this the whole county has been aroused, and now there are eight clubs, and a county association, composed of delegates from the various clubs. The Belmont Club now numbers 70 members, and represents capital to an amount of more than a million dollars. Though we have not yet been able to reap the full benefit of co-operation in buying and selling, yet we are doing so to some extent. The saving to some of our members up to January, less than twelve months, had been over \$200, and many have saved largely in the purchase of seeds and spring fertilizers, besides getting much better articles than are generally sold by small dealers. There has been no movement since the war that has given so much encouragement.

NORTH CAROLINA.—*Moore*: There is commendable improvement in flour-milling, both by steam and water power, and in quality the flour will compare favorably with that made elsewhere. *Robeson*: Not much flour-milling or wool-working, but the people seem to be more alive to the importance of cotton-manufacture, and in some instances arrangements have been made, and are being made, to that end, water-power being abundant. *Greene*: Previous to the introduction of the Patrons of Husbandry, in August or September last, there was no co-operation in selling products or buying supplies. Since that time they have united, to a limited extent, in purchasing cotton-bagging, ties, and pork, saving, in the aggregate, two or three thousand dollars. The granges are now discussing the subject of buying pork, commercial fertilizers, &c., and also that of direct shipment of cotton to foreign ports by the State grange.

SOUTH CAROLINA.—*Union*: In purchasing supplies and fertilizers, a few of the granges have saved from 5 to 10 per cent. by ordering in quantity and paying cash. This has affected only a small part of our county. I believe that one-half of our laborers depend on liens to give them their supplies this year. I will add, as to labor, that a few foreigners have immigrated to us. I know more of the Italians than any others. They labor well, particularly those from the middle and north of Italy; but they have no families, and, of course, we cannot expect them to settle down and make the best of citizens. We need immigrants who will take root here, and make part and parcel of the nation. *Barnwell*: There are three organized granges in this county, but they have not yet been successful in practical results. *Marion*: We are beginning to derive benefits from co-operative buying. The trouble is that too few of the farmers are in condition to avail themselves of its benefits. A few individuals did co-operate in buying fertilizers last year, and by so doing saved \$150 on \$1,000 worth purchased. *Greenville*: Efforts are being made to establish country stores, to enable the farmers to supply themselves with better and less expensive foods, groceries, dry goods, &c. Home-manufactured cotton, wool, flour, and timber are increasing among the white people.

FLORIDA.—*Levy*: There is no co-operation among the farmers of this section, jealousy and distrust ruling the people, keeping them from uniting to send for supplies, or helping each other in any way. *Santa Rosa*: This county is not a field to be looked to for progress in the line indicated. The manufactures are confined to lumber, except the usual workshops of a community.

GEORGIA.—*Gordon*: We have had no co-operation in selling or purchasing in our immediate section. We have a very fine flour-mill recently fitted up, which has a capacity to grind all the wheat raised in our county. A cotton-mill is in process of construction in the county, that will use much of the cotton raised, which is said to be the most lucrative investment in the country. *Upson*: By co-operation in purchasing supplies, we were able to save 25 per cent. on bagging and ties, 60 per cent. on shoes, and from 90 to 110 per cent. on iron, and everything else in proportion. Co-operation is, with us, in its infancy, and consequently our operations are not very extensive. There is some little agitation upon the subject of manufacturing our own cotton. *Liberty*: Co-operation is 'not only impracticable but oppressive to the South. For instance, the last season was disastrous to our southern products, and the granges of the West have co-operated to enhance the prices of bacon and flour. This may be a blessing in disguise, however, and force the South to abandon cotton-culture and devote her attention to cereals. *Dooly*: There is as yet no co-operation among planters. Every man acts for himself, independently of everybody. When cotton is "up," a majority of planters sell early, but the past cotton season they were forced to sell in consequence of the heavy liens resting over them. Our State legislature has repealed this "lien-law," which never should have been upon our statute-book. *Early*: I am glad to say that we have a cotton-factory of 1,100 spindles, established since the war, consuming about 500 pounds of cotton per day. Nothing manufactured at present but yarns, which supply the home demand, besides shipments to other points. It has one of the best water-powers in the Southern States, and is capable of running an almost unlimited amount of machinery. *Macon*: In my own neighborhood forty or fifty planters have united and purchased several thousand dollars' worth of meat, flour, sugar, coffee, lard, &c. By so doing we have saved \$5 per thousand on bacon, \$10 per thousand on flour, \$20 or \$30 on sugar, and so on, on nearly every article purchased in this way. *Brooks*: There has been no co-operation in selling products or purchasing supplies in this county the past year to an extent worthy to be mentioned. There is a cotton-factory, run by steam, of fifteen hundred spindles, at Quitman, in this county, in successful operation, which also cards, spins, and weaves wool. It is regarded as a good thing for our county. No other efforts have been or are being made toward "extending" or manufacturing the products of the county.

ALABAMA.—*Saint Clair*: Our people sometimes send to the manufacturers and purchase articles in quantity at the makers' wholesale prices. *Lauderdale*: We have two cotton-factories, started within the last two years, which consume about 1,000 or 1,200 bales, and make a good market for country produce.

MISSISSIPPI.—*Smith*: In selling we make a saving of \$1.53 per bale. In purchasing supplies we save about 20 per cent. *Claiborne*: By selling through our grange agents we have realized better prices, and save in commissions and charges equal to three-eighths of one cent. per pound in cotton. By buying through them we save from 20 to 40 per cent. *Hinds*: The farmers buy by the wholesale as long as they have the cash, and I believe a great revolution (an economic one) is now inaugurating. The merchants fear it, and are feeling its effects. I am glad the financial crisis is upon us. I am as much of a sufferer as any one, but it will save us from debt. The lesson is a severe one, but needed. I am satisfied many thousands of dollars have been saved by co-operative buying. *Attala*: It is believed that \$10,000 have been saved by co-operative movements the last year. *Panola*: The farmers have been benefited to some extent in the sale of their cotton and the purchase of supplies. *Rankin*: Associations for co-operation in purchasing supplies are extremely popular. The problem they undertake to solve is a hard one, viz: If one man with no money can purchase no supplies, how much can a thousand such men purchase? *Lauderdale*: In this county the Patrons of Husbandry have saved a considerable amount by establishing an agency at Meridian. In this they are obtaining their supplies, and even dry goods, at retail at a fixed percentage on wholesale cost, ranging from 2½ to 10 per cent. The whole amount saved in this way in the county by the agency here and by purchasing from other agencies must amount to \$50,000. *Newton*: In some instances planters who were unincumbered in their business have shipped their cotton to grange agents, and saved from \$2.50 to \$10 per bale. The saving is greater in buying than in selling. Parties have had flour delivered at \$7 per barrel that would have cost them, if bought, \$10, and there is a proportionate saving in other articles.

TEXAS.—*Fannin*: An organization was formed in November, 1872, to ship and sell cotton and purchase supplies. The cost of supplies was 15 to 25 per cent. less than retail prices, but the cotton remains unsold. *Uvalde*: Co-operation in the sale of beef has been of most advantage—say 20 per cent. profit; in farm-produce say, 15 per cent. Stock-drovers, Government contractors, and farmers have realized by co-operation during the last year, \$1,500. *Hill*: Little if any advantage has been gained by co-operative selling, but in the purchase of farming utensils, dry goods, &c., a very great saving has been made, and farmers are organizing to increase the benefits.

ARKANSAS.—*Lafayette*: We co-operate with nothing, and make no effort to extend anything else than our credit.

TENNESSEE.—*Grainger*: As to co-operation, there is nothing of that here; we are too far behind the times for that; the people here do not know that it is necessary to bring the plow, loom, and anvil together; time will cure this. *Giles*: We buy machinery, seeds, agricultural implements, &c., at a saving of 25 to 50 per cent. The building of flour and cotton mills, and other manufacturing establishments, is receiving attention, and strongly, by our best planters and agricultural press. We have recently had No. 1 flouring-mills and factories for manufacturing wool established near us; formerly our wool was sent to Bowling Green, Ky., or to New Albany, Ind.; we not only find it a convenience, but a great saving to have our products manufactured at home. Without specific data, I would say that at least \$100,000 were saved to my county last year by co-operative efforts. It is the only time during my life (fifty-three years) that the farmers had any concert of action or co-operative movement. *Greene*: Efforts are not yet matured for co-operation in selling products and purchasing supplies; but a determination to do so was sternly manifested, and has been so rapidly organizing that, outside of any co-operation, supplies can be purchased at a reduction greatly below prices prevailing a very few months since; reduced prices are attributable more to *prospective* co-operation than to any as yet in practice. *Haywood*: One cotton-mill has been erected at Brownsville the past year, with 100 looms, and the very best improved machinery, which promises to do well and is a step in the right direction. *Bedford*: Commenced organizing in our county last fall, and are just now, this year co-operating in the purchasing of supplies and farm-implements; they are making a saving now of 25 to 33 per cent. *Monroe*: There is no co-operation among farmers here yet. Flouring-mills are plenty, but do not grind more than one-fourth of the wheat-crop, *i. e.*, the surplus, for the want of capital. No woolen-factories in the county, but parties at Sweetwater are endeavoring to get up capital to erect a cotton and woolen factory. *Sumner*: We have already had decided gains in the purchase of many articles, but they have not assumed proportions sufficiently definite to base a report upon. They will work good if they have not too much steam for the burden to be propelled. *Washington*: Something has been accomplished in the way of co-operation in buying and selling. A few of our neighbors bought salt and plaster last season, and on a car-load saved thirtydollars. At another time they bought molasses at 44½ cents per gallon, that would have cost them 90 cents to \$1 if bought at retail. *Montgomery*: The system was begun at the latter part of the year. In one instance the farmers saved \$200,000 in storing their tobacco. *Grundy*: Several efforts have been made during the past year to form different co-operative establishments, but so far as I am aware they all died on the start. *Fayette*: In the sparsely-settled South it is much more difficult to obtain concert of action than in the Northern States. The negroes are also a drawback; they are all engaged in agriculture, but have as yet neither the means nor the inclination or ability to assist such movements, neither have they the inclination or the brains to improve. We are working and hoping and praying that before another twelvemonth will expire we will have better news to communicate. One large flouring-mill recently erected in the neighborhood, but the wheat is brought from abroad.

In the Western States, however, the co-operative movement has been general and active, involving nearly every county, and, in its economic aspects, decidedly beneficial. The saving by association for purchase of supplies has been large; the benefits of combination for sales of products have not been so positive. If wisdom and calmness continue to rule the efforts of farmers to secure the benefits of association the results will be cumulative and beneficent; diversity of production will obviate extreme fluctuation in price; manufacturing industry will compete for surplus labor in agricultural districts; the legitimate profits of producers will not be eaten up by locust-like hordes of non-producers, and agriculture will prosper.

WEST VIRGINIA.—*Wayne*: The only co-operative system practiced here is between the farmer, his hogs and his cattle, when he hitches up his team and drives through his corn-fields after they are ripe, and gathers a part of the crop, and then the hogs come in and gather the remainder; after them the cattle follow, and such of them as *can* subsist during the winter on the fodder that the farmer and his hogs have left standing. *Randolph*: There has been no saving either in selling of products or purchasing of supplies. No efforts have been made toward improvement. No flour-making except for home-consumption, no pork-packing, no woolen-factory, and all for want of intelligence and skill, enterprise and capital. *Nicholas*: Nearly all our products are manufactured here at home and for home-consumption.

OHIO.—*Logan*: I estimate that 28 per cent. of the farmers of this county have joined co-operative associations, and that they have realized a considerable saving. *Cham-*

paig: Our granges have received from manufacturers proposals for the sale of their farm-implements at lower rates than they sell the same to their agents. Sewing-machine manufacturers have done the same, the reduction in some cases being as much as 50 per cent. *Geauga*: There are from one to three co-operative cheese-factories in every township in the county; some of the factories are owned by individuals, who buy the milk from farmers at a price agreed on; others work up the milk of their patrons at a stipulated price per pound of cheese. Other factories are owned by the community, and men are hired to work up the milk. *Hancock*: Machinery has been purchased co-operatively, and on this one item alone 40 per cent. has been saved to the purchaser. Benefits have also accrued from co-operative selling, but the precise amount saved not well known, but may be safely estimated in thousands. *Morgan*: One "farmers' club" (numbering about fifty farmers) have saved \$1,000 the past year by purchasing their goods and supplies in quantities, and the sale of their home-commodities in quantities and shipped together.

MICHIGAN.—*Hillsdale*: No co-operative institutions here. We have several quite extensive flouring-mills in the county, manufacturing for export. We have one woolen-mill with a capacity of 120,000 yards per annum, valued at \$170,000, and have improved their spinning by adding a self-operating attachment at a cost of \$2,500. We have also one cotton-mill just started, and we think it will be a success, with a capacity of 70,000 yards per month. The cheese-factory at Reading is said to be the most successful in the county, and the largest in the State. Three years ago we had one in almost every neighborhood, but they have nearly all failed. Our grazing lands are not sufficiently compact to render the business generally profitable. Our butter is said to yield us more money than our wheat; four packers have paid out \$75,000 for butter during the past year. Our poultry and egg trade is also very heavy.

INDIANA.—*Ripley*: The only co-operation here is for purchasing milk for the Cincinnati market. We have a number of flour-mills, but none on an extensive scale. Our hogs are all shipped to Cincinnati, and the same may be said of cattle and sheep. But one woolen-factory in the county, running about six or seven looms. *Gibson*: A farmers' club established here; succeeded in purchasing for its members \$185-reaping-machines for \$155. The greater part of our pork is packed at home; but the greater part of the wheat-crop is shipped off. *Miami*: We have the largest woolen-mill in the State; owned by a company; our flour-mill is not sufficient to work up one-fourth our crop; our pork-packers have not cut up more than one-fourth the product of the county. The foundations of an extensive pork-packing establishment are now being laid, to begin operations next fall. *Pike*: We have one carding-machine, four grist-mills and a dozen saw-mills. There has been no extension of manufactures of any sort. If we had a railroad we could furnish millions of bushels of good coal, as we have thousands of acres of coal near the surface, from 3 to 10 feet in thickness. The flour manufactured to ship amounts to only 200 or 300 barrels per year; 20,000 hogs are driven annually to Cincinnati and other markets. *Brown*: Flattering reports are spread of the beneficial effects accruing from the organization of granges of patrons of husbandry; they have been but two months in existence, and in another month the county will be thoroughly organized and ready to begin operations. *Stark*: The co-operative movement is spreading rapidly throughout the county; in the selling of produce and purchasing of supplies a reduction has been obtained of at least 10 and 15 per cent. on supplies, and 25 to 30 per cent. on farm-implements, and, at the same time, obtained 10 per cent. more for their produce. *Morgan*: A large and extensive pork-packing establishment has been erected within the past year; 12,000 hogs were slaughtered the first season; the saving to the people of this county, by this enterprise alone, has not been less than \$35,000 during the season.

ILLINOIS.—*Mercer*: Some of the earlier granges think they save from 10 to 20 per cent. in their stores and goods. Arrangements are now perfected to purchase at wholesale prices, saving in some cases 50 per cent.; in fact we save for ourselves the former profits of the middle-men, and some think more. I believe as the result of co-operative action that the farmers of this county have already saved four or five thousand dollars, and will be enabled to save five or ten times that amount next year. *Lee*: Co-operation has, to a large extent, secured cash payments for all farm-implements, at wholesale prices. The granges are raising large reserve-funds, for the purpose of making their county and State purchasing-agents dictate prices to manufacturers, by buying largely at one time and paying cash, and in many instances saving to the farmer 50 per cent. *Vermillion*: Purchases are being made through the grange organizations, mostly through a county purchasing-agent; farm-supplies, sewing-machines, farming implements, wagons, fruit-trees, &c., are being purchased at wholesale prices, from 25 to 30 per cent. less than formerly. No benefit has yet been derived from the granges in the selling of farm-products. *Boone*: Co-operation yet in its infancy, still some benefit in the purchasing of supplies. As to manufactures, we have five or six thriving cheese-factories, three wagon-factories, one carriage-factory, carding-mill, flax-mill, and plenty of grist-mills. *Payette*: In some communities they have been purchasing family supplies and some farming implements during the past

year, and they claim a saving of 30 per cent. on all such purchases. *Sangamon*: Co-operation has grown rapidly during the last twelve months; arrangements have been made with merchants and manufacturers for special rates. Two rolling-mills have been established near Springfield, and several new and profitable coal-shafts have been opened; two new lines of railroad have been run through the middle of the county. *Massac*: A large proportion of the wheat raised in the county was manufactured into flour and shipped; nearly all the pork raised last season was packed in the county and will be sold as bacon.

WISCONSIN.—*Dodge*: Co-operation has benefited members or patrons, in the sale of wool an increase of 15 or 20 per cent.; in the sale of sheep, 20 or more per cent. *Fond du Lac*: An average saving of at least 20 per cent. is claimed by those who have had the privileges of the co-operative movement. *Adams*: Some sections report a saving in the purchase of machinery and supplies, of \$100 and over; a saving has also been made in the selling of products; one of my correspondents says: "I believe our town has manufactured and sold 150 barrels of buckwheat-flour." *La Fayette*: Commodities are purchased from 25 to 40 per cent. less than formerly demanded; the total saving in the county from the movement may be safely estimated in thousands. *Outagamie*: A reduction of 50 per cent. in the freight on plaster delivered to us, and a saving of from 35 to 40 per cent. on farm-implements. *Green*: There are mills enough to manufacture all the wheat raised in the county into flour, yet this is not done, most of the wheat going to Milwaukee. One woolen-mill is in operation that consumes 20,000 pounds of wool annually.

MINNESOTA.—*Dakota*: A saving of from \$20 to \$100 per family in the purchasing of groceries and dry goods; a flouring-mill has also been built by co-operation. *Houston*: The members claim that they save from 10 to 15 per cent. in the purchase of farming implements, machinery, goods, supplies, &c.; a large flouring-mill has been put in operation during the past summer, and the result is a better market for good wheat. *Dodge*: We have got a reduction on our groceries and dry goods, but not on our machinery, nor have we got a cent more for our produce. A company has been formed in Claremont, in this county, who are building a flouring-mill to be propelled by wind-power; the company is composed of farmers who propose to grind their own wheat, and if it should be successful others will soon follow. *Martin*: The granges have saved their members from 25 to 30 per cent. on their purchases, and an increase on their sales of about 10 per cent. On purchases alone I think the granges have saved the farmers of this county at least \$10,000, and an increased value of \$5,000 on their sales during the past year. *Douglas*: Have only had four months' experience in co-operation; in purchase of supplies we save about 18 per cent., on machinery 30 to 40 per cent. *Wascea*: Probably \$20,000 have been saved by the granges concentrating their trade with one merchant and thus keeping the prices down.

IOWA.—*Delaware*: No marked change in selling, but in the buying of agricultural implements there has been some saving, some say as much as 20 per cent., others claim 10 per cent., but the great bulk of implements are still purchased in the usual way. *Boone*: Co-operation has not been of such a character as to result in any material benefit to any portion of our producing population. Useful and remunerative manufactories are but in their infancy, and as such their utility to the country and their profit to themselves must necessarily be somewhat limited. *Johnson*: The co-operative movement has had the effect to produce a more uniform price for the farmer, and by purchasing for cash gives the advantage of low prices; in this way the producer has saved 20 per cent. in sales and purchases. *Poweshiek*: A saving of 10 per cent. in the purchase of dry goods. *Calhoun*: I think we have better prices for our grain and stock, and we certainly get our machinery from 20 to 50 per cent. less than we ever did before. *Jefferson*: The only effort made in this county has been the establishing of "grange stores," the proprietors of which agree to sell for a certain per cent. less than the customary profit, on condition that the farmers' organization shall deal exclusively with them. This has effected a slight saving on their purchases. *Green*: But little has been done here except in the way of purchasing general merchandise; arrangements have been made with dealers to furnish us goods at from 10 to 15 per cent. profit on wholesale cost. *Guthrie*: We have saved from 30 to 50 per cent. in purchasing of our plows and other farm-implements; heretofore we paid from \$5 to \$6 for shoeing a span of horses, we now pay from \$3 to \$4 for shoeing a span. *Buena Vista*: The price of coal has been reduced from \$6.50 to \$4.50 per ton; the community has saved \$1,500 this way. *Hardin*: The farmers from this point shipped six car-loads of hogs last fall, realizing about \$50 per car-load over what buyers were paying. We are running a warehouse at this place, and have shipped over forty cars of wheat, several of oats, &c.; parties in other points of the county have also shipped considerably. In return for our hogs our agent brought us groceries at a saving of 25 per cent. Sewing-machines are bought by members for \$54, whereas the regular price in the market for the same machine is \$90; we save from 15 to 40 per cent. on our implements and almost every article we need; in this locality alone I might safely assert we have saved at least during the past year, \$2,980. *Plymouth*: Some little has been saved, by co-operative effort, in the pur-

chase of goods by the granges of this county. *Polk*: All our supplies, groceries, &c., are purchased by the car-load and at a considerable saving to the consumer; also encourage all kinds of manufactures among our own immediate neighbors and throughout the State. Besides the amounts saved in our purchases, we have been obtaining 10 per cent. in advance of our former sales. *Iowa*: Five per cent. saved in shipping, 15 per cent. saved on farm implements, and 50 per cent. on groceries and supplies. *Tama*: A large saving in purchase of farm-machinery. *Grundy*: A great scarcity of money prostrates everything; with all the demand at home and abroad for wheat, it can be had for 85 cents per bushel.

MISSOURI.—*Boone*: We are now aiming to get up a large manufactory of implements for farm use; a large woolen-mill is near completion, and a pork-packing establishment of average capacity is in operation. *Gasconade*: Most of the grain is either consumed in the county or manufactured into flour, meal, &c., at the various mills. Wool is generally manufactured into cloth at home, and large quantities of wine are made each year. *Greené*: By their meetings, farmers have been brought more into contact with each other, which no doubt has, in many ways, been of benefit to them, learning what is best in the methods of each other. During the past year there has been put in operation a first-class cotton-factory, costing some \$125,000, a good woolen-mill, and also quite an extensive cotton-factory; and there will, in all probability, be a large pork-packing establishment in operation this approaching fall. But all these enterprises are either joint-stock companies, or carried on by private individuals. *Harrison*: The co-operative movement did not commence until late in the season; but it has shipped 1,000 head of hogs at a saving of from 80 cents to \$1 per head. The purchasing of supplies has just been inaugurated, and already promises a handsome advance in this county. *Lawrence*: The Grangers are beginning to reap the benefits of co-operation in a few things, such as the shipping of horses, which is beginning to pay very well, and the bringing down of the prices of a few articles considered necessary. No new effort has been made toward manufacturing home productions in pork-packing nor wool-working. This county, however, possesses the resources for immense wealth if properly assisted by skill and capital. *Moniteau*: The Patrons have, in a small way, been testing the benefits of their system in purchasing agricultural-implements and family supplies. The implements have been purchased at a reduction of 15 per cent.; but arrangements have been so perfected that, by the next crop-season, they can be had for 30 per cent. less than formerly. Family supplies are bought at 15 per cent. less than formerly. I estimate the total saving of the county at \$10,000 during the past year. A woolen-mill is talked of; also a grain-elevator, and a pork-packing establishment will be ready for the next hog-crop. *Clinton*: Last spring some of the enterprising farmers of this county and the one adjoining county (De Kalb) formed themselves into a joint stock company, with a capital of \$30,000, divided in 1,000 shares. The object of this company is to procure cheap supplies and farm-produce, and save to themselves the profits of the middle men. A small woolen-factory has lately been put into operation, and the question of "extending" the products of our county is freely discussed. *Washington*: We have, as individual enterprises, excellent flouring-mills, for the manufacture of all our wheat and corn; beef, mutton, and pork find a ready market at our furnaces and mills, at better rates than the Saint Louis market affords, hence nothing is shipped to the general markets. *Newton*: A reduction in the cost of supplies of from 5 to 50 per cent; and one-half or two-thirds of the farmers belong to the granges. *Saint François*: Eight or ten granges have been established, but as yet no practical benefits have been realized. *Reynolds*: All our corn, wheat, pork, &c., are taken to the railroad, about twenty miles distant, and sold by the merchants of this place, who buy whatever the farmer has for sale, pay for their purchases in goods and then ship the same at stated. *Osage*: Machinery is purchased for 10 per cent. less, but there is no great amount of manufacturing here. The total amount saved from co-operative effort is perhaps not far from \$3,000. *Callaway*: As yet not much has been done, except to effect a saving in the purchasing of supplies, as we had but very little to sell; but our groceries, farm-machines, sewing machines, &c., are now got at greatly reduced rates. *De Kalb*: But a comparatively small saving has been the result, as merchants have sold as cheaply as the co-operative stores could, and in that way a saving has been effected for all. No efforts toward manufacturing any raw material. *Pettis*: No higher prices have been realized in selling through the influence of the grangers; but in buying, the saving has been from 30 to 50 per cent., and the total estimated aggregate amount saved is put down at \$75,000 in this county alone. There is not sufficient wheat raised in the county to supply the mills that are at present in operation. Wheat is brought in from adjoining counties and flour is extensively exported. Our hogs are all shipped to Saint Louis and Chicago, and bacon is reshipped the next summer season. One woolen factory is running, but for home consumption only.

KANSAS.—*Reno*: The benefit derived from co-operation in the purchasing of supplies has been of great advantage to many farmers; 20 per cent. has thus been saved; there is an effort to build a first-class mill, to be run by water-power, and it will be in readiness for our next crop. *Cowley*: In once instance the farmers united and appointed

an agent from their number, and he sold 1,000 bushels of corn at 40 cents, instead of 35 cents, that others who sold individually were receiving at the time. We are in an extremely flourishing condition, and possess some of the best natural advantages in the State—good streams and heavy belts of timber affording excellent protection to stock. *Neosho*: An effort is being made by the grangers to purchase one of the best flouring-mills in the country. *Butler*: A saving of 25 per cent. on farm-implements. *Doniphan*: The greatest benefit derived thus far from granges and farmers' unions is the organized determination to improve upon the present system of agriculture, and to resist all extravagant and useless expenditure that bear so heavily upon the farmer. But when we see the large number of acres on most farms growing to weeds year after year, with heavy expense of tax and fencing, the useless waste of animal food that should have been utilized, the vast quantity of farm-implements and machinery rusting and rotting on the ground, and then consider that much of this had been purchased with borrowed money, at ruinous rates of interest, the problem seems very plain. *Douglas*: The most good accomplished by the granges has been a toning down in the prices of all sorts of goods, and a large amount of money thus saved. *Franklin*: It is estimated that during the last year at least \$5,000 were saved by purchasing farm-implements and machinery through the influence of the Patrons of Husbandry in this country.

NEBRASKA.—*Merrick*: The Grangers are doing away with quite a number of middle men; they are really purchasing all their supplies at an average of 15 per cent. cheaper than outsiders. *Hall*: About \$1,000 saved in the purchasing of trees; blacksmithing has been reduced 30 per cent; hardware, 10 per cent.; groceries, 5 per cent.; we have also been able to obtain increased prices for our produce. *Otoe*: So far as it has been tested, co-operation has been of great advantage to the farmer, both in saving the profits realized by the middle men in the sale of farm products, and also those which are realized by agents in the purchase of farm machinery and implements, as well as instruments and utensils for household use. *Cass*: Farmers claim they saved from 20 to 30 per cent.; merchants are beginning to give us better terms on staple goods. *Nemaha*: At least \$5,500 was saved by the farmers holding on to their hogs and thus forcing speculators to come to their terms.

CALIFORNIA.—*Alameda*: The co-operative movement as yet has not amounted to what many had anticipated either in this county or State, and it is a mooted problem whether, for the present, much advantage will grow out of the movement, particularly in the handling of the grain-crop on this coast, which has to find a foreign market. The "wheat ring" of this State controls eight-tenths of the capital that can be obtained to handle the grain-crops of the Pacific coast. Through their agents in Europe, Australia, and other foreign countries, they are and have been chartering ships six and eighteen months in advance, and should a stray ship come into our ports, they will bid the charter so high as to forbid all competition. *Stanislaus*: The little co-operation we have had here has certainly had the effect of sustaining the price of wheat and kept the speculators from realizing the large gains they have hitherto enjoyed. A few farmers joined in erecting a large warehouse in the city of Stockton and receiving on storage, at a low figure, hundreds of tons of wheat, and those in need of funds to pay debts or expenses pledged their warehouse receipts to moneyed men at a low rate of interest, thus obviating the necessity of crowding their products upon the market and depressing the prices. Thousands of dollars were thus saved to those who took advantage of the measure.

OREGON.—*Lane*: Merchants are reducing the price of farm-implements and other things, so there will not be much difference when the co-operative measures will be introduced. *Douglas*: Through the State agent at Portland we can purchase farm-machinery at a reduction of 15 to 35 per cent. less than formerly.

TERRITORIES.—WASHINGTON.—*Walla-Walla*: The co-operative system of buying and selling has not been sufficiently tested yet in this county. We have already several good flour-mills in operation, one woolen-factory, and are now getting ready to establish a manufactory for manufacturing sugar from beets.

UTAH.—*Box Elder*: From wool raised in this county, mixed with a little cotton-yarn, there has been manufactured, by the aid of machinery, nearly sufficient cloth to supply all the people of the county in that line, but some has been sold to the neighboring county, and the hides have been manufactured into leather, which our shoemakers have made into boots and shoes. All this has been done by co-operative system, represented by a large number of farmers, who have saved thousands of dollars to the county. *Salt Lake*: Our co-operative system during the past year has been very discouraging, chiefly through mismanagement, though other and more deplorable causes have contributed largely to the disaster befalling an association established under most favorable auspices, and heretofore yielding fair and satisfactory dividends. *Rich*: We co-operate in fencing our fields, and thus save time and means, and also, to some extent, in purchasing supplies, but none in selling. We have now three flour-mills, five saw-mills running, three more in course of erection.—*Weber*: Through co-operative effort the following shipments of products

have been made: Wheat, 126,000 bushels; barley, 19,000 bushels; oats, 9,000 bushels; dried peaches, 160,000 pounds. Total value, \$175,200. *Iron*: We have a store on the co-operative plan, owned by the people, in shares of \$25 each, and which declared a dividend of 25 per cent. last year. We also have a co-operative stock-raising company, with a dividend of 50 per cent; also, a co-operative sheep-herd, which has declared a dividend of 50 per cent. A co-operative tannery is also in operation. All these associations are of vast benefit to the people and have saved them thousands of dollars, and they have also kept us out of the clutches of rapacious middle men and speculators. *Morgan*: We have a co-operative mercantile company, embracing mechanics as well as farmers, for the purpose of disposing directly of our produce, and purchasing our goods, implements, and machinery wholesale.

DAKOTA.—Lincoln: Nothing has been made from co-operation in selling products, but in purchasing supplies about 10 per cent. has been saved. Two flouring-mills have been put in operation during the past season. They will flour about one-fourth of the wheat raised in the county during the past season. *Bon Homme*: Two flouring-mills have lately been brought into the county, but not yet completed.

QUALITY OF THE COTTON-CROP.

A special circular, addressed to our regular corps of correspondents in the cotton States, intended mainly to obtain the local views of planters as to quality of the fiber of the last crop, causes of injury, and incidentally other peculiarities of the season, makes the following inquiries:

1. At what date did picking commence in your county, and what date would you fix as an average for a series of years? How much later (or earlier) the last year?

2. At what date did the first killing frost occur this season, and what is the average date for the recurrence of such frosts?

3. At what date did the cotton caterpillar make its appearance?

4. What is the quality of the fiber in comparison with an average quality, and what the cause and character of injury of that which is injured? What portion of the different grades?

The responses have been very general, including a large portion of the cotton-growing area. It was not expected that there would be either a uniform or accurate classification, which might perhaps be better reported by commission-merchants of the several cotton-markets; but the peculiarities of the cotton of different localities, and their various causes of damage to the fiber, can only be properly set forth by the planters themselves.

In analyzing these returns the idea is forced upon one's attention that the cotton-planters, like the average fruit-grower, dairyman, or other rural specialist, loses immensely by lack of system and thoroughness, as well in culture as in preparation for market. It is easily demonstrable that immense sums could be saved by a slight elevation of the standard of skill and care in picking and ginning. At present low prices little more than half a cent per pound would make ten millions of dollars in a crop of four million bales. A great difference in grades is inevitable, but it is easy to increase the proportion of the high grades. A glance at this variety, and the difference in prices, as shown by the last quotations in the New Orleans market, will illustrate this view: Low ordinary, $8\frac{3}{4}$ to $9\frac{1}{2}$ cents; ordinary, $10\frac{3}{4}$ to $11\frac{1}{2}$ cents; strict ordinary, $11\frac{1}{2}$ to $11\frac{3}{4}$ cents; good ordinary, 13 to $13\frac{1}{4}$ cents; strict good ordinary, $13\frac{1}{4}$ to 14 cents; low middling, $14\frac{1}{2}$ to $14\frac{3}{4}$ cents; strict low middling, 15 to $15\frac{1}{4}$ cents; middling, $15\frac{1}{2}$ to $15\frac{3}{4}$ cents; strict middling, $15\frac{3}{4}$ to 16 cents; good middling, $16\frac{1}{2}$ to 17 cents.

Nearly three hundred cotton counties are represented in these returns. Divided into three classes, those returning quality as average, those expressing various grades of superiority, and those with indications of average quality inferior to that of a series of years, we find the percentages represented by each of these classes to be respectively 36, 37, and 27. This would indicate a quality for the entire crop a little above an average. The injury by caterpillars to the earlier pickings cut short the top crop, which is inferior and liable to be stained, while the fine weather of the autumn ripened more thoroughly the middle crop.

The reports of quality, in comparison with an average for a series of years, are, in North Carolina, divided very nearly equally between the three classes, average, below average, above average, with a slight preponderance in favor of the latter. In South Carolina the number in each of the three classes is exactly equal. Georgia reports an advance in quality, 27 per cent. of the reports being below and 40 per cent. above average. In Florida the average reports are not numerous, the other two classes being equal in number. In Alabama, average reports are 40 per cent. of the whole number; above, 36 per cent.; below, 24 per cent. Mississippi, average, 45 per cent.; above, 22; below, 33. In Louisiana scarcely any of the reports indicate superior quality; those below average slightly predominate over the average reports. Decided superiority in quality is reported from Texas, nearly half of the reports being above average, and very few below. Only 22 per cent. of Arkansas reports are below average, 43 above, 35 average. More than half the Tennessee reports indicate superior quality, the remainder average.

The causes of injury are various, the more prominent being the ravages of worms in stopping the development of the bolls and staining the fiber; the destruction of the plant, or beating out the fiber, or reducing its grade with dirt and "trash" by heavy storms of rain or wind; premature decay arising from imperfect cultivation, superabundant moisture in the soil in the spring, drought in summer, and the train of diseases which accompany low vitality of the plant from whatever cause; and, finally, the effect of frost in arresting the development of half mature fiber and in discoloring it. The relative influence of each cause, in damaging the crop of 1873, as indicated by our correspondents, may be stated in the following order in the different States:

North Carolina.—Rains, frost, worms.

South Carolina.—Rains, frost, worms.

Georgia.—Worms more than all other causes combined; rains, frost, drought, high winds.

Florida.—Storms of rain, worms.

Alabama.—Worms, rains, frost.

Mississippi.—Worms, spring rains, drought, frost.

Louisiana.—Worms, rains, high winds.

Texas.—Worms, rains, drought, frosts, bad gins and inexperienced ginners.

Arkansas.—Rains, worms, drought, frost.

Tennessee.—Drought, frost, rains, plant-lice, a cold and wet spring.

In the Gulf States the greatest injury thus appears to have been wrought by worms, excepting only Florida, where the devastating storms in September and October, particularly that of September 19, proved more destructive than the caterpillar, which was abundant and sufficiently injurious. Though the main damage by insects was done by the caterpillar (*Anomis xylinæ*), there was much loss occasioned by

the boll-worm, (*Heliothis armigera*,) and some injury in localities by the the cotton-louse, or *Aphis*.

The theory of our entomologist, which he deems to be sufficiently verified by some years of study in the field, as to the movement and spread of the caterpillar is, that in the more northern portion of the cotton-belt the frosts of winter destroy the insect in all its stages, unless in situations of unusual protection, but that in the more southern portion, where severe frosts rarely occur, they survive the risks of winter, and as they increase, by their repeated generations during the summer, they migrate northward in the fly-state (the perfect insect) to "fresh fields and pastures new." This would account for the general prevalence of the insect on the Gulf coast, and its comparative scarcity and late appearance in more northern regions, which facts are by no means singular in the records of the past year, but in accordance with the history of former visitations. Their first appearance in Florida was noted in June, while in North Carolina they generally came too late to do much injury; indeed, their presence is rather desired in September by many northern cultivators, that the leaves may be partially stripped and the growth of weed checked for the better maturing bolls before the coming of October frosts. Very few of the Tennessee counties report injuries by cotton-worms, and those are either in the first or second tier of counties from the southern line, and in no case is the injury reported of any great severity. In Georgia several southwest counties reported the presence of worms in June, as Stewart, Schley, and Sumter; in July the counties infested were farther north, but considerably scattered. A similar state of facts is presented in returns from other States, sufficient to show that their earliness of appearance, and therefore serious multiplication in subsequent months, bears a marked relation to the degree of winter temperature of different cotton-growing districts. Still, it is impossible to trace closely every step in their progress northward, from the fact that the caterpillar and boll-worm are not generally distinguished in the reports, but are usually included under the term "worms."

These returns also include a record of the time of commencing the first picking, a statement of the average date for a series of years, the date of recurrence of the first killing frost, and the average date of the first destructive frosts. The statements of the different counties of each State, so far as reported, are recorded and an average made, which is presented in the following table:

States.	Date of first picking.		Comparison with last year.		Killing frost.		Appearance of worms.
	1873.	Usual date.	Days earlier.	Days later.	1873.	Usual date.	
North Carolina	Sept. 16	Sept. 9	.....	10	Oct. 21	Oct. 21	Aug. 29
South Carolina	Aug. 30	Aug. 23	.....	8	Aug. 22	Oct. 25	Aug. 28
Georgia	Aug. 27	Aug. 26	.....	4	Aug. 22	Oct. 25	Aug. 22
Florida	Aug. 13	Aug. 9	1	.....	Oct. 30	Nov. 8	June 28
Alabama	Aug. 26	Aug. 28	.....	3	Oct. 20	Oct. 19	July 28
Mississippi	Aug. 27	Aug. 23	.....	6	Oct. 22	Oct. 23	July 21
Louisiana	Aug. 27	Aug. 17	.....	8	Oct. 28	Nov. 4	July 22
Texas	Aug. 26	Aug. 15	.....	18	Oct. 29	Nov. 7	July 28
Arkansas	Sept. 11	Sept. 17	3	.....	Oct. 24	Oct. 22	Aug. 23
Tennessee	Sept. 5	Sept. 11	5	.....	Oct. 15	Oct. 16	Aug. 16

These figures indicate about an average forwardness of the plant in Georgia, with a constantly increasing retardation westward, from Alabama to Texas, though singularly enough the date of the five States differs only by a single day, all but Texas and Alabama having the

27th of August as its date of commencement, which is later than usual for the Southwestern States. But in the next tier of States in the Mississippi Valley, in which the commencement (the average for all counties) is usually deferred to September, the usual date is anticipated six days in each, though Tennessee was still eight days behind Mississippi, and Arkansas fourteen days. The cotton counties of Tennessee being almost confined to the Tennessee Valley and the area lying between the Tennessee and the Mississippi, the date is made earlier than the average for Arkansas, though the bulk of the Arkansas product is made from counties which would average as early a date of picking as those of Tennessee. Pulaski County, Arkansas, returns a comparison with several recent years, which is as follows:

	1873.	1872.	1871.	1870.
Picking commenced.....	Sept. 10	Aug. 25	Sept. 1	Aug. 25
Date of killing frost.....	Oct. 23	Nov. 24	Nov. 11	Nov. 17

The recurrence of killing frosts appears to have been later in Arkansas than usual, as late in North Carolina, varying little from usual average dates in South Carolina, Georgia, Alabama, Mississippi, and Tennessee, and decidedly earlier in Louisiana, Texas, and Florida. On the whole, the average date appears to be somewhat earlier for the entire crop, but the fine weather for ripening and picking in November and December far more than counterbalanced this small disadvantage, and added a material amount to the aggregate of cotton to be gathered.

This is given as approximate data on these subjects. It would take very careful and long continued observation and record in all of the counties to establish true averages; and the local variation is so wide, and the change from one year to another is so great, that successive periods of definite length, as quinquennial or decennial, might never be found to agree very closely with each other.

The following extracts, giving the pith of some of the most noticeable explanations concerning the quality of fiber and causes of injury, will illustrate the general tenor of the returns upon these points.

NORTH CAROLINA.—*Harnett*: Not as good as average on account of rains. *Greene*: As good as I ever saw it. Very little yellow cotton, and the yield of lint in seed-cotton never better. *Montgomery*: Fiber a little less than an average. Damage caused by much rain during the maturing season, and on account of rust the lower grade worth nothing. *Beaufort*: Pronounced above an average. Amount of inferior grades smaller than usual. On account of caterpillar, and other causes, there is no top-crop, hence nearly all the bolls were fully matured before opening; also, more mature was used and better cultivation than usual. *Pamlico*: About 100. No injury; 20 per cent., low middling; 60, good ordinary; 20, ordinary. *Lincoln*: 100. Opened early and almost all at once, and not much rain, so that there is very little difference in the grades. *Franklin*: Better than an average. *Polk*: Cotton opened better than usual, and there is less yellow this season. *Gaston*: Character of fiber good, and the per cent. of yield from seed large. Only injury is from frost, which, on account of lateness of crop, will be considerable. *Bertie*: About an average and none injured, except the very late. It runs low middling and good ordinary, about equally divided. *Mecklenburgh*: Better than the average; less stained than for ten years. A large proportion is low middling. *Davidson*: Quality below average. Cause of injury lateness of fruitage, the longer warmer days being necessary; abundant rains, causing a too rapid and large growth of weeds at the expense of fruit. At least one-third of crop injured. *Pasquotank*: Fiber is of average quality. *New Hanover*: Appears to be lighter, compared with the average of former crops. The cause must be rust and caterpillar. *Stanly*: Longer and finer in every variety cultivated. Wind and rain, by throwing out and soiling, have injured the first opening to a small extent; but the late opening bolls, yielding the lowest grade, have not suffered much. *Gates*: About an average. Injured by caterpillar and early frost. At least one-third ordinary.

Cumberland: Average; some injured by frost and heavy rains. Twenty-five per cent. stained or yellow. *Wake*: Not quite so good as last year. Caterpillars and wet weather caused some injury. *Rutherford*: Lint cotton is better than common, owing to dry warm weather for picking. *Pitt*: Twenty per cent. over an average. Injured by being caught by frost before full maturity. Proportions, 90 good, 10 injured. *Camden*: Poor; not more than 75 per cent. *Onslow*: Second grade. *Warren*: Equal to the best average. There is but a small proportion of inferior grades, as our seasons were good and the frosts late. *Granville*: Above average. Too much rain in August damaged the crop a little, not much. *Tyrrell*: Fiber harsh compared with other years. *Guilford*: Good in comparison with an average. But little cotton is injured in any way.

SOUTH CAROLINA.—*Georgetown*: Fiber good in the early picking. Heavy and protracted rains in September damaged the remainder. *Richland*: Unusually good. Cotton did not open until well matured generally. Much is injured by yet remaining in the fields. *Orangeburgh*: As good as usual. About one-fifth stained from rains. Middling three-fifths, low middling two-fifths. *Edgefield*: Will compare favorably with an average. Much is short from effects of rust and caterpillar. To classify, would say, five-eighths good, middling, three-eighths lower grades. *Greenville*: Finer. *Lexington*: About an average—not quite equal to last year. Excessive rains caused injury by rotting the bolls and staining the fiber. Proportion, 1st grade, 60 per cent.; 2d, 35; 3d, 5. *Clarendon*: Something above an average. Rain injured the first picking, but a favorable change in the weather gave a much better quality. Taking the crop as a whole, the quantity and quality fall below an average. *Fairfield*: Good as usual. *Marion*: Perhaps four-fifths will be of superior quality. The remainder will lack maturity. *Cheraw*: About an average. Only two or three grades in the market; low, middling, and ordinary. About one-eighth will be ordinary. *Barnwell*: Not quite an average, in consequence of unfavorable picking season. Middling, one-fourth, lower middling, one-fourth, ordinary, one-half. *Chester*: Average, one-third, low middling and above; one-third, good ordinary; one-third, ordinary. *Williamsburgh*: Not equal to ordinary average. Too much wet weather injured the early picking, making it dingy and trashy. October pickings injured by immature bolls, having imperfect seed. The larger part of the crop is low middling, some middling, and strict middling, the boll and ordinary. *Marlborough*: Quality of fiber equal to the average. *Newberry*: Better this season than usual. The cause of short staple is drought. The only injury to the staple this season is from stain on red lands.

GEORGIA.—*Spalding*: An unusual proportion of good cotton. Only injury sustained was stain caused by worms and one severe storm. *Richmond*: Below average, owing to irregularity of season and loss of leaves by caterpillar; about one-fourth will average Liverpool middlings; balance lower grades. *Charlton*: Equal to an average. Injury sustained is one-fourth to one-third of the crop, caused by the caterpillar, which fell mostly on the inferior grades. *Dawson*: The fiber is over average. *Whitfield*: An average. No injury and consequently no low grades. *Early*: Much below average. Causes: Wet weather while the bolls were maturing, imperfect cultivation, poor land, storms, and worms. Staple dirty and inferior; one-fourth ordinary, one-half good ordinary, one-fourth low middling. *Dooly*: First picking is an average of former years. Last picking considerably damaged by storms, caterpillars, and frost; would say 15 per cent. *Columbia*: Fine, perhaps above an average. No particular injury; mostly damaged by wind and rains. *Clayton*: Equal to an average. Injured by caterpillars and storms. *Effingham*: Good as last year in quality. *Calhoun*: Is an average. Low middling, one-fourth; ordinary, one-half; low ordinary, one fourth. *Worth*: An average, but lighter. Injury was done by the caterpillar cutting the leaves, and then a rain on it, by which the open bolls were badly dyed or stained. We have a new cotton called the "Mexican." It has a leaf like the "negro-killer," and "sweet-potato vine," and is called by some "Negro-killer cotton." It is a pretty good cotton and can be improved. No caterpillar or insect will touch it. Very scarce, and I could only obtain two dozen seeds. *Oglethorpe*: Fiber 10 per cent. better than last year, and above the average. *Gordon*: Better than an average. A very small proportion stained by frost. *Monroe*: About average. Perhaps three-fourths low middling, balance inferior. *Troup*: Fiber much shorter than usual. Neither the seed nor fiber matured well. *Schley*: As good, except what we call "motes," which is unmaturing seed, caused by caterpillars stripping the foliage and thereby stopping the maturing of the bolls and causing premature opening. *Stewart*: Twenty per cent., low middling; 35 good ordinary; 25 ordinary, and 20 below ordinary. *Sumter*: Far above an average. Very little injured. *Forsyth*: Better than an average. But two grades this season: nine-tenths first quality; not more than one-tenth injured by caterpillar and frost. *Campbell*: Above average. Slightly stained by frost, about ten per cent. *Johnson*: Late picking injured about 25 per cent. by caterpillars. *Madison*: Not an average on account of caterpillar and early frost. *Upson*: Fiber extraordinarily fine of the cotton that matured before caterpillars struck it. The green and unmaturing bolls that were stripped by caterpillars were seriously injured; the fiber short and poor, and

the seed unfit for planting. About one-third good, one-third medium, and one-third poor. *Hall*: More good cotton than we ever had; but little yellow cotton. *Butts*: Better than usual. *Putnam*: Rather better than average. Some litter from the caterpillar. *Cherokee*: Almost all of the first grade; probably one pound of inferior to fifty of good. *Cobb*: Said by buyers to be better than common. Some trash, caused by worms, and some yellowish, caused by frost. *Hart*: Nearly all good middling, there being little or no yellow cotton. Long dry fall, favorable to picking. *Marion*: First picking good. Second picking injured by caterpillars, about one-third, and third picking one-half. *Wilkes*: Good; probably above average. One-half to two-thirds good; remainder injured by being blown out, standing in the field too long, and stained by rain and frost. *Jefferson*: About 90 in comparison with an average. Excessive rains and caterpillars caused some injury. The late bolls nearly all lost from these causes. *Brooke*: Quality of fiber is an average; probably above. Nearly one-half damaged by storm; gathered from the ground and full of sand, dirt, and trash. *Macon*: What we have always sold as low middling cotton has been classed this year as good ordinary. Planters are inclined to think this is a result of the money panic, rather than a difference in the fiber. *Taylor*: Bottom, or first crop, average quality. Middle, or second, about $57\frac{1}{2}$; top, or third, not more than 10, average. Worms damaged middle crop, and nearly completely destroyed the value of the third. *Warren*: Fiber perhaps an average compared with former years since we commenced the use of commercial fertilizers. *Floyd*: Better than average quality, but does not sample so well because of the gluten or slime left by worms. Fibers unusually long and strong; not injured by the worm. One-half to five-eighths appears to be damaged somewhat by stain, which imparts a dead, dull appearance. *Fulton*: Equal compared with average. *Murray*: At least 15 per cent. above an average. No injury. *Houston*: About one-tenth inferior on account of immaturity, caused by caterpillars. *Muscookee*: Full average. Later picking deficient on account of the foliage being stripped by caterpillars, and bolls opening prematurely. *Bartow*: All of 5 per cent. better. More good cotton this season than usual, as we have the most favorable fall for a number of years.

FLORIDA.—*Jefferson*: Storms blew much off it, and it was injured by trash and sand. Grades, about one-half good ordinary, a little low middling, balance ordinary. *Jackson*: Better quality than usual; classed in the market as "good ordinary;" a few bales reach low middling and occasionally middling. In one part of our county, on account of storms and heavy rain, the cotton is stained by the red soil. The litter occasioned by the worm injures the appearance, the rust retards the growth and causes imperfect development of yield, injuring appearance and staple. *Gadsden*: There is a marked superiority in the quality of the fiber, whether considered with reference to length, strength, or fineness, over the average of the crops of former years. It is attributed to favorable weather which marked the close of the growing season, bringing the bolls to a fuller maturity, and consequently a more perfect development of the fiber. *Columbia*: Ten per cent. inferior, and rain in September the cause. All of the bottom crop or lower grade injured. *Suwannee*: About one-fourth of the crop badly injured by storm of September 19; the remainder fully an average. *Orange*: Equal an average; injury was caused by storm of the 6th of October. The lint was blown out of the bolls and made trashy. Much that was open was destroyed by a severe storm on November 15. *Wakulla*: Supposed to be a little below the quality of last year. Causes, too much wet weather and too little cultivation. The gale on the 19th of September damaged one-fourth of the crop. *Leon*: Divided into two grades—"storm cotton" and "before the storm cotton"—about one-half of each; former sandy and trashy; latter about as usual. *Lery*: Greater proportion of lint to seed; staple not so fine, though stronger; only injury was from rust; about four-fifths medium fair, one-fifth fine. *Putnam*: Better, owing to planting improved seed. Deteriorated fiber, caused by inferior seed and impoverished land. Seed not improved will naturally deteriorate, and land impoverished by continual cultivation and no manure, will cause rust, which has seriously damaged the staple. Common, 80; fine, 20.

ALABAMA.—*Oxford*: Fully equal to former years, but our cotton merchants say that ours is nearly all classed as low middlings, this year not more than 10 per cent. of the amount below middlings. *Macomb*: Fiber is inferior to an average quality; cause, injury done the plant by the worms. Usual proportion of different grades. *Butler*: The cotton fiber is of average quality. Some cotton is injured by rain and being picked trashy. About two-thirds of our cotton will classify as ordinary, one-sixth as low middling, and the other sixth as inferior. *Lawrence*: Strict good ordinary to low middling, with an occasional bale of middling. Last year (1872) it was ordinary. This is the classification of our most intelligent merchants. *Limestone*: The first picking much better than usual. About half the crop will be inferior, owing to the trashing of the worms, and will be much stained by the excessive rains in the latter part of October, and the first of this month. *Saint Clair*: The injury is caused by boll-worms and caterpillars. The worm bores into the boll, and causes it to stain and rot. The caterpillars impoverished the late bolls, and prevented them from maturing, and thereby stained the cotton, and damaged the fiber. In many instances the caterpillar ate up

the bolls, and in others bored holes. *Perry*: Above average. But little strict middlings. One-half middlings, and the balance low middlings, and ordinary. The sandy lands always produce the best grades of cotton. *Bibb*: Inferior. The caterpillar cut off the leaves before the cotton matured. *Marengo*: On the upland excellent, strong, and of good length. On the bottom lands, short and weak—injured by worms—much of it opening prematurely. One-tenth low middling; seven-tenths good ordinary, and two-tenths ordinary. *Crenshaw*: Ravages of worms caused some trash, but not more than usual. Three-fourths of the crop good; one-fourth from good fair to inferior. *Choctaw*: About as good as usual. *Blount*: Better than average. Less yellowed by late opening and exposure than usual. *Greene*: Twenty per cent. middling; 50 per cent. low middling; 30 per cent. good ordinary. *Walker*: Better than an average season. It is nice and fine. *Montgomery*: Fair average, there being no top or late cotton. No inferior fiber, except from neglect or delay in picking. *Bourbon*: Full average. After the first picking the yield of lint from the pound of seed-cotton was most remarkable, being in some instances, as much as two-fifths per pound of lint, whereas the average is not more than one-third. *Henry*: Caterpillars and storms injured the fiber. The proportion of grades is about one-tenth low middling; one-half good ordinary, and the remainder ordinary. *Conecuh*: Cotton crop never was gathered in better condition, and the fiber will compare with previous years. All cotton from this county (with few exceptions) sold the present year has been classed as low middling. Mobile merchants say that the fiber or staple is short. Know of no causes for short fiber save the ravages of the caterpillar and dry weather during its maturity. Have only two grades, low middling and spotted; very little of the latter. *Lauderdale*: Very good, except on some few lowlands, where it rusted. Rust wilts the plant, and neither seed nor lint comes to maturity. The grades are about one-fourth to three-fourths. *Tuscaloosa*: Fiber of the bottom crop good; the balance of the crop not so good on account of ravages of worms. Two-thirds good; one-third indifferent. *Clarke*: About the same. First picking injured by excessive rains. Grades, one-quarter ordinary, three-quarters low middling. Prices ruling now, 13½ to 14 cents. *Randolph*: Better than common. The difference this year is slight. The damage was on bottom lands.

MISSISSIPPI.—*Jasper*: Quality below an average; supposed to be caused by the wet season. The greatest amount of grade "ordinary." *Marion*: Not as good as usual. Cause, the early date at which the leaves were destroyed. Most of our cotton classes low middling, say nine-tenths. *Madison*: Fiber is an average quality; about low middling. *Lee*: Worms and drought killed the top crop. All opened early, and consequently the grades are lower than formerly. No yellow or frosted cotton. *Winston*: Above average, from the fact that there has scarcely been any rain to injure the cotton during the last ten or eleven weeks: *Clarke*: One-third middling, one-third low middling, and balance good ordinary. On this question I have depended on cotton-buyers for information. *Smith*: About the same as last year. *Warren*: Five per cent. better than last year, owing to the better maturity of the bolls before opening, and about equal in quality to an average crop. *Grenada*: Fiber shorter and lighter, owing to a too-hurried maturity, brought about by a sudden transition of the crop from a very wet season to an excessively dry one, and the crop laid by in the wet. *Clairborne*: All cotton coming to market here was much above the average. *Attala*: Is equal to an average quality. Worms, and extreme seasons of rain and drought, have caused the injury that has occurred, which is mostly to the poorer grades—about one-fourth of the crop. The other portion would have been fine could it have been saved from trash and dirt. *Leflore*: Average; no injury. *Tishomingo*: Good average, except shorter through drought. But little of highest grades, if any; middling, two-thirds; one-tenth good middling; remainder, ordinary. *Kemper*: More good cotton this year than usual. *Newton*: A little better than an average; no injury; one-half, low middling; one-quarter, good ordinary; one-quarter, middling. *Amite*: The fiber this year is inferior, especially where the caterpillar ravaged. One-third of crop injured. Common staple the only grade raised. *Tunica*: About average. Proportions about equal from good middling to low ordinary. *Jefferson*: Not so good on account of worms. Great deal of immature cotton opened after the leaf was stripped. Stained from worm-excrement. *Jones*: Quality somewhat below an average. *Rankin*: Fiber a full average. An unusually small proportion has been injured by frost and long exposure. About 80 per cent. of the crop saved in good condition. Four per cent. frosted, and 16 injured by exposure. It will rate at about 60 per cent. middling, 20 low, and 20 ordinary. *Wilkinson*: Fully one grade lower on New Orleans classification. Staple shorter from too much cloudy weather or want of sunshine to mature; 45 per cent. good ordinary, 40 low middling, and 15 middling. *Panola*: Inferior cotton opened rapidly in September, faster than it could be saved, and a rain-storm on the 27th of September materially injured the entire crop.

LOUISIANA.—*Concordia*: The quality of the fiber is average, but the cotton does not class as high as average, owing to the fact that it is filled with pieces of straw and leaf, caused by worms, and which is not taken out by the gins. It is what we call *trashy*.

Union : Good, fair quality, in early matured crop ; later crop, short staple ; proportion, 1 to 3 of latter pickings. *Rapides* : From low middling to middling ; fiber stained by rains. *Aroyelles* : About 25 per cent. less than an average, on account of very wet season, and early destruction of leaf by worms ; about a general proportion of all grades. *East Baton Rouge* : Ninety per cent. ; classed as low middling. *Franklin* : Our cotton may be properly put in two classes—that which fully matured prior to September 1, and that which did not. The first, embracing 60 per cent., is about average ; the second, amounting to 40 per cent., 30 per cent. below average. *Tangipahoa* : Various grades nearly same as usual, perhaps 10 per cent. a lower grade. *Yalobusha* : There will be a larger proportion of nice cotton than usual, as the fall was favorable and crop gathered early. All saved before the heavy rains which fell on the 22d and 23d of November is nice cotton and of good fiber. *East Feliciana* : Not good, owing to heavy rains. *Morehouse* : The cotton picked up to middle of October is fine or low middling to strict low middling. All picked after that time is injured by heavy rains and winds, and is rated as good ordinary ; 20 per cent. of the former damaged, and 10 per cent. of latter.

TEXAS.—*Bosque* : Quality of fiber better than average. Top crop slightly injured by frost. *Sabine* : Better than last year. Injured some by rain and worm ; 50 per cent. injured. *De Witt* : Better than the average of former years, owing partly to the introduction of improved seed. Our cotton is not classified here by brokers, but there is great uniformity in the staple. The bulk of it is classed in the market as "good ordinary." *Smith* : Above average. New Orleans classification : one-eighth low middling, one-eighth strict good ordinary, one-half good ordinary, one-eighth ordinary, and one-eighth low ordinary. *Titus* : Two-thirds will compare favorably with an average of last year. One-third inferior. The freeze of October 20 caught the plants with an excessive growth and flow of sap, followed by a light rain which extracted and dripped the frozen sap upon all of the cotton not gathered, staining it badly. *Anderson* : 10 per cent. better ; 20 per cent. stained by frost. *Kaufman* : In comparison with an average 10 per cent. better than last year. Injury was caused by excessive rains followed by drought. *Henderson* : Above average. Our cotton averages middling to low middling. *Liberty* : Possibly not an average, owing to not selecting the best seed. Peelor and Dickson planted in about the usual quantities. But little sea-island. *Burnett* : Very good ; none injured ; 45 per cent. middling, 40 low middling, 10 good ordinary, and 5 ordinary. *Grimes* : Fully equal to an average, where cotton has been properly picked and housed. Fully 25 per cent. is low middling, and over 40 per cent. good ordinary to low middling, and 35 per cent. good ordinary. *Washington* : Fiber fair, but cotton light. Ordinarily 1,500 to 1,600 pounds seed-cotton makes a 500-pound bale. This year it takes 1,700 to 1,800 pounds. The quantity of seed-cotton that would have turned out nine bales last year would only turn out eight this year. *Bexar* : The season having been so favorable the quality is 10 to 15 per cent. above an average. Nothing has injured the crop. Our best planters say we shall average 2,500 pounds on every three acres. *Freestone* : one-fifth ordinary, three-fifths good ordinary, and one-fifth upper grades. Improved in preparation for market, and gradual improvement in varieties planted. *Caldwell* : For many years it has taken from 2,000 to 2,500 pounds seed-cotton to make a 500-pound bale of lint. This year it only takes 1,600 to 1,800 pounds of seed to make 500 pounds of lint. *Lamar* : Matured later this year. Late rains caused the fruit (bolls) to hang on the stalks very late without ripening, which is unusual for a dry season. *Cooke* : Quality of fiber about an average. *Austria* : One-fourth to one-third of the cotton raised in the county by white labor may be classed as middling to good middling. The better grades of cotton are only produced by white (mostly European) labor ; that raised by negroes always classed as inferior. *Lavaca* : The first picking, as a general thing, is the best and cleanest, consisting of about one-half to three-fourths of the crop. Later on, the winds and storms blew much out on the ground, where it lies too long and is damaged. This season, however, the rule is reversed. Owing to the wet summer and early fall the first picking was much stained and rotted, the bolls next to the ground being entirely lost where the plant was rank. The present picking is a grade better than the first. *Cherokee* : Frost, and a yellowish hue therefrom ; also 25 per cent. that will not open. Strictly middling, 50 per cent. ; good ordinary, 25 ; low middling, 25. *Williamson* : Not quite an average. Rains and worms stained the fiber, particularly the last picking. The lower grades injured the most. About one-third of each crop will class as good ordinary, low middling, and good ; but little inferior. *Bell* : Better than formerly, owing to introduction of improved varieties, Hurlong, Golden Prolific, &c. *Dallas* : Considerably above an average. Have had light rains this fall, consequently the cotton is but little stained or trashed. Larger proportion of it will class as good middling, and but little inferior. *Limestone* : The bulk of the cotton produced here will class "good ordinary" as known in commerce. About one-tenth will class low middling. *Fort Bend* : Crop exceedingly short ; but what little there is the fiber is good and not surpassed by any previous year. *Goliad* : Crop this year better than an average. *Blanco* : Average quality of

fiber is low middling. Injury was caused by caterpillars and frost. Proportion of good grades, seven-eighths. *Collin*: Full average. Only injury caused by frost, which is about 15 per cent. of the crop. *Matagorda*: Fiber fair; late cotton immature and stained. Most of this little crop is nicely saved, and will class good ordinary to low middling. *Comal*: The fiber in this county ranges from good ordinary to low middling. Very little difference in the grades, owing to the care with which the Germans handle their crops. *Rusk*: About two-thirds is of good average quality; the remainder below average, as the bolls opened prematurely from hot sun and want of foliage. *Fayette*: Full grade below average, caused by caterpillars and wet weather. Do not classify cotton until it gets to market. Strict ordinary this year. *Nacogdoches*: Fiber about the same. Clear of dirt, but not as good as the ginning of last year. *Upshur*: Superior to the average. Growing-season better than usual, but too short. Injured by frost, being later than usual by two or three weeks, owing to too much rain in the early growing-season, and boll-worm, which caused an overgrowth of the weed and too much sap in the young bolls. There are but two grades this year; all cotton ripe before the heavy frost is of the first grade; all that was not is of the second, and is stained yellow. The first grade will be about five-sixths of the entire crop. *Leon*: Better than average. Worms and hot weather injured a small proportion. One-half good ordinary, some low middling, rest inferior to ordinary. *Burleson*: Equal to former years. Largest proportion good ordinary.

ARKANSAS.—*Bradley*: Two grades above last year, or about 103. Some dirty cotton from heavy rains. *Little River*: Average. After frosts opened cotton in October, continued beating rains materially damaged the fiber. *Sebastian*: Good, and equal to general average; generally produced on uplands; very little grown on bottom-lands. *Izard*: There are only two grades of cotton here. First picking, coming under the head of strict good ordinary; later picking, inferior. *Jefferson*: Fiber above an average. *Franklin*: Below average; drought principal cause, also heavy rains in September. Classed: Stained, ordinary, good ordinary. *Boone*: Fiber full average. *Columbia*: Below an average quality on account of the large proportion of bolls that were not matured when the worm destroyed the leaves; consequently opened badly, and lint short and yellow. About 75 per cent. is of lower grades. *Pulaski*: The fiber of all cotton opening before the frost is of average quality. Causes of deterioration in 1873 were drought and appearance of boll-worm in August; heavy rains occurring about September 1, followed by rot and rust, early-killing frost October 23d, which cut the crop short at least 10 per cent. *Montgomery*: Fiber fully up to the average; some think a little finer and longer. *Greene*: Better than the average; about 75 per cent. is of the best quality. *Arkansas*: Best ever seen here. *Cross*: Better; about 105. Middling, one-eighth; low middling, three-eighths; ordinary, one-half. *Marion*: The fiber is a full average. *Baxter*: Is not as good as last year by 25 per cent.; produced by drought. *Union*: Shorter; caused by caterpillar, drought, and rust. *Drew*: Generally better than usual. *Independence*: Fiber is as long and fine as usual, and has been secured in better condition than common. *Perry*: Considerable injury was received from the frost, say 12 per cent. *Crittenden*: Good average; some stained by the frost; better handled, and consequently less bad cotton than usual. *Hempstead*: Shorter than usual in places where the leaves were lost before the full development of the bolls, but the early bolls are as good as usual. The grades will be almost as usual; good ordinary, a small proportion of low middling, and possibly twice as much ordinary; say good ordinary, 85 per cent.; low middling, 5; ordinary, 10. *Fulton*: Would have been above average but for the black rust; that not injured by the rust is the best fiber I ever saw in this county; proportion, two-thirds in favor of better grades. There is comparatively no yellow or frost-bitten cotton, and the crop being light and the fall favorable, it is pretty well gathered. *Searcy*: The fiber is better than common. It is long and white, and will equal any cotton ever raised this far north.

TENNESSEE.—*Dyer*: Better than an average, and not more than one-twelfth injured by the frost. *Mauzy*: Fiber better than last year; less injured by frost, and in this respect a better quality. *Lawrence*: Above an average, and has not been damaged. *Hardin*: Fiber is fully equal an average; no injury, except too much drought in July. *Davidson*: About an average; the season for picking has been very good; have put up fifty bags of very handsome fiber. *Lincoln*: Full average this year. Heavy rains caused some little injury; about one-eighth of crop slightly damaged. *Cannon*: Quality very fine; no yellow cotton; all good. *Lauderdale*: At least one grade above an average. Low middling, one-fourth; good ordinary, one-half; ordinary, one-fourth. *De Kalb*: Average quality. *Bedford*: Fiber is a good average; the season has been good for picking. *Perry*: Better this year than usual. *Haywood*: Superior. Frost followed by a rain always stains cotton; one-fourth is stained this year. *Decatur*: About average; crop light on account of drought. *Gibson*: The fiber this season of superior quality to any crop for several years. The only injury was by drought in August, which caused many of the bolls and blooms to fall off, and hastened the maturity of those that remained. The larger proportion will be classed as low middling, and there will be less of the "flower-pot" or dirty cotton.

THE TOBACCO-CROP.

Tobacco is a special crop, very irregular in its distribution and fluctuating in extent of local breadth, and hence specific investigation is necessary even to obtain comparative estimates of quantity. Though it is produced in all the States, there were only fourteen States in 1870 (on census authority) that produced (each) as much as 1,000,000 pounds, while several counties in tobacco States yield each two, three, to five millions of pounds. Kentucky and Virginia are credited with more than half of the crop, the former State alone 40 per cent. of it. Only seven States separately exceeded 10,000,000 pounds, Kentucky Virginia, Tennessee, Ohio, Maryland, Missouri, North Carolina, in order of precedence. Yet in point of fact the product was much greater than indicated by the census, the fear of taxation doubtless preventing a full return. As an instance of deficiency, the national census of Ohio makes a total of 18,741,923 pounds. In 1869 the State assessors returned for the same year 38,953,206 pounds; and undoubtedly neither census obtained a return of the entire production. These seven States produced about 85 per cent. of the tobacco grown.

Few people apparently realize the small area actually occupied by the crop. Allowing 100,000,000 pounds increase over the 262,735,341 pounds reported by the census, twenty townships of land yielding 800 pounds per acre will suffice. This is the size of a medium county. This fact affords an explanation of the necessity of care in preventing great fluctuations in the breadth of production, and shows how easy it would be to glut the market and ruin prices.

A recent inquiry was directed to our correspondents in counties producing not less than 100,000 pounds, for an actual census or careful estimate of the quantity harvested in 1873, the average price, the number of acres cultivated, and the quality of the crop. Returns have been received from a large proportion of them; and as tobacco is a crop so restricted in its breadth, and so peculiar and variable in its qualities and yields, it is deemed best to give the details from each county instead of our usual condensed statements by States. It will also illustrate the immense labor, of which the public generally have no idea, of tabulating, averaging, and analyzing returns of the more extended and general crops. If any of these county returns are inaccurate, an opportunity is thus afforded for correction.

One county in New Hampshire, Cheshire, in 1870 returned 97 per cent. of all the tobacco reported for the State. Its estimate is now 200,000 pounds, instead of 151,189 pounds in 1870, and the quality is good. It is on the Connecticut River, adjoining Franklin County, in Massachusetts.

Three counties in Massachusetts, on the Connecticut, returned in 1870 all but 23,610 pounds of the 7,812,885 pounds made in the State. Franklin estimates 25 per cent. increase on 1870, 40 per cent. better than the crop of 1872. A reduction is indicated in Hampshire, but the quality is good. A small increase in Hampden, "some very good, but much the larger portion low grade; color very uneven, caused in part by drought checking the growth, in part by a too large proportion of special fertilizers and too little barn-manure, but principally from too late setting." The price is low, averaging 10 cents per pound.

Connecticut grows some tobacco in every county, though Hartford is credited in 1870 with 5,830,209 pounds of the 8,328,798 pounds reported. Hartford this year reports 6,000,000 pounds, grown on 3,239 acres, worth 24 cents per pound, of a "fair quality, but not equal to the best on account

of extreme drought at planting time, which caused late maturing and injury by early frost; and some did not cure well on the poles on account of extremely cold winds in November." "Leaf very fine" in Litchfield, but some white stem and frosted leaf. "The crop is a good average compared with former years" in Tolland.

Onondaga, Chemung, and Steuben, in New York, are the only counties reporting 100,000 pounds in 1870, when the aggregate was 1,884,048 pounds of the 2,349,798 pounds in the State. The estimate for the three in 1873 is 2,324,730 pounds, grown upon 2,387 acres. In Onondaga "there are now on hand the crops of 1872 and 1873. The quality of the crop of 1873 is generally good, of all that got an early start. It was very dry at setting time, and many failed to make their plants grow, in consequence of drought and grubs. Some fine tobacco-land was set three or four times over, and such tobacco is of a low quality." A material reduction in breadth is prophesied for the present year. In Chemung "its comparative quality may be represented by 90, and the cause is bad color, caused by unsuccessful curing in sheds, and in some localities from injury by hail before maturity." The crop is grown in Steuben "along the valley of the Conhocton River, and is not so perfect in the leaf as the Connecticut."

Three counties in Pennsylvania, Lancaster, York, and Bucks, produce nearly all the tobacco grown. An immense increase is shown in Lancaster, from 2,692,584 pounds in 1870 to 13,683,600 pounds in 1873. The estimate is based on returns of the assessor of internal revenue, "who reports 30,010 cases, at an average of 360 pounds per case, or 13,683,600 pounds as the crop of 1872. The tobacco interests had been increasing, from 1871 to 1872, from 31,800 cases for 1871 to 38,010 for 1872." Low prices have prevented further increase, it is thought, and our correspondent makes the estimate the same as 1872. The prices received are \$15 per hundred for wrappers and \$5 for fillers, or an average of \$13, according to the proportion of the grades. The crop in Bucks is not disposed of; the average price last year was 16 cents. That planted early is of good quality, but the late, which was three-fourths of all, is very poor, owing to excessive droughts in the earlier stages of growth and too frequent rains while it was maturing, making a narrow leaf and woody stems. "Nine-tenths of the tobacco raised in this county is grown in the immediate vicinity of the old William Penn mansion, in Falls Township, taking the place of wheat. In 1870 and 1871, and previous to that time for several years, it was our most profitable crop; now the market is overstocked, and many farmers just commencing to cultivate it will suffer serious loss unless the price should advance considerably."

The official returns of tobacco in Maryland make a total of 15,785,339 pounds in 1870, against 33,410,965 pounds in 1860. Five counties, which supply about 60 per cent. of the total, report an increase of about 20 per cent. on the last census crop. The following extracts from correspondence are given:

Prince George's: Sales last year (of the crop of 1872) were from 3 to 13 cents per pound. Some place the probable price of the crop of 1873 at 5 to 14 cents per pound, or an average of 9½. *Carroll*: Quality is generally good. *Howard*: The production is on the increase in our county, although last year was a bad planting season, on account of a protracted drouth, which prevented early planting. *Charles*: The comparative quality of the crop on hand is above an average. The last season having been a good one, the tobacco was housed early, and we had a fine fall for curing. *St. Mary's*: The crop of tobacco for 1873 was exceedingly varied in this county; in some portions very fine in quality, in other parts very little planted for want of rain. *Montgomery*: The comparative quality is rather less than fair, though there is some very fine in certain localities, depending upon early planting and the quality of the soil. Late

planting was besieged by the horn-worm, which greatly injured and in some measure destroyed certain lots.

Returns from twenty-four counties in Virginia, which, in 1870, averaged one million pounds each, and together produced about two-thirds of the crop, indicate a crop in 1873 larger by 30 per cent., or 48,000,000 pounds in the entire State. Most of the counties make unfavorable reports of quality, though a few make it better than usual. The average value as reported is 7 cents 8 mills. A few particulars are culled from returns :

Nelson : The quality is inferior to that of the two preceding years, and results from a scarcity of plants and want of a favorable season for planting in good time, the weather being very dry about the time the plants were large enough to set out. The latter part of the summer was too wet, causing much of it to fire; and having been planted late, much of it had to be cut in a green state, or get frosted by standing out. *Franklin* : Quality is good. Cause, early planting and close attention, peculiarity of soil and climate. *Roanoke* : Not very good on account of drought. *Dimwiddie* : Quality poor, caused by late planting and excessive wet season, causing the crop to spot and drown. *Botetourt* : The quality is very fine on our warm limestone land, but not so good in the grass region. *Pittsylvania* : Common quality. Season of 1873 unfavorable for quality but not for quantity. *Louisa* : Hardly average; cause, drought last summer. *Floyd* : Not so good as in 1872, on account of drought in summer and early frost. *Charlotte* : Quality not so good, owing to prevailing drought during last summer. *Prince Edward* : Quality of the crop of 1873 below the usual average; cause, insufficient labor. *Lunenburg* : Average quality. Late rains in early part of the season caused a less quantity, but does not affect quality. *Albemarle* : Quality much better than usual, owing to the very excellent season and the late frosts. Many farmers were enabled to cure their tobacco better than ever before. *Rockbridge* : Good shipping. Our lands not adapted to finer grades. *Mecklenburgh* : About 75. Too dry in the early part of the season and too wet in the latter. *Patrick* : Inferior to previous year. *Chesterfield* : Much inferior tobacco, owing to the wet spring and early frost. A great deal had to be cut before maturity. Wherever early planting and a good stand were obtained, the crop was good; brought \$11.50 and \$12 per hundred in the Richmond market. The high price of fertilizers and low price of tobacco will deter many of our planters from raising as much as usual in 1874. *Goochland* : Good. Many farmers cut their crops before maturity, owing to indications of an early frost, which made the quality of such crops indifferent. *Fluvanna* : The quality of tobacco made last year is better than usual. *Caroline* : Best sun-cured crop on the market. *Henry* : Inferior, caused by late growth.

Ten counties in North Carolina which produced 8,666,948 pounds of the total 11,150,087 in 1870, make returns which aggregate very nearly the same in 1873. The quality averages very well with that of former crops; some a little better, two below average. In Surry about one-tenth is very fine, "perhaps as fine as any raised in the United States, soil and climate being so well adapted." The Davie correspondent reports good quality, and claims for his county thorough cultivation, adaptability of soil, careful handling, assorting, and packing. Caswell, long noted for its fine, yellow tobacco, and for producing more than any other county in North Carolina, has a small crop, only 2,000,000 pounds, not of average quality, and worth 9½ cents instead of 10 to 11, the usual price. Drought during the summer months prevented thorough maturation. It is the money-crop of the county. Rain in August and September deteriorated quality in Granville. A part of the county of Stokes had a fair crop, being affected by drought, which delayed growth and prevented full development.

There is no county in South Carolina or Georgia that reports 100,000 pounds, and but one in Florida, Gadsden, which produced 118,799 pounds of the 157,405 pounds reported in the census of the entire State. It is the Cuba tobacco which is exclusively grown here. Only 50,000 pounds are returned as the crop of 1873, worth 38 cents per pound. The area planted is estimated at 80 acres, yielding a little over 600 pounds to the acre. When labor was abundant to clear the richer hummock land, years ago, the average product was 800 pounds. The re-

marks relative to this peculiar tobacco region may be worth giving more at length :

Gadsden : The Gadsden "wrapper-leaf" was always in high repute, and extensively used in the manufacture of cigars, being in size, fineness, and texture fully equal to the best Cuba, and far superior to the Connecticut seed-leaf. Where the variety known as the Cuba-filler has been tried, it has succeeded finely in this county, possessing that delicate and peculiar aroma so highly prized in the Havana cigars. We need but the capital to manufacture our tobacco into cigars (thus affording us a home-market for the raw material) to make the cultivation of it the most profitable crop that is grown. It is a singular fact, but nevertheless true, that of all the counties of the State, many of them abounding in the very finest soil, Gadsden is the only one that has succeeded in making the Cuba tobacco a staple market-crop. Prior to 1860 it rivaled in net returns the great staple cotton, and from the indications of the present year, it is about to resume its former status among the agricultural productions of this county. Whether this success is attributable to any peculiarity in the elements of the soil I am not able to determine, but this fact is worthy of note, that, except immediately on the banks of the Apalachicola River, which forms the western boundary of the county, there is an entire absence of the rotten limestone, which so largely pervades the other sections of the State. I will only add that for the immigrant, or new settler of limited means, there is no crop so well suited to his condition as the Cuba tobacco. To produce a given result there is a less area of land required than is demanded for the production of any other field-crop. The cultivation, housing, and preparation for market is simple, and the labor so light that it may be participated in by every member of the family, male and female, over six years of age. The growth of the plant is so rapid, and its arrival at maturity so quick, that it need never interfere with any of the provision crops, and but slightly with a moderate cotton crop. In illustration, and confirmatory of the above statement, I give the experience of a citizen of this county who

known to me as a truthful and reliable man. In 1872 he cleared one acre of good pine-land, and after breaking it up and applying \$8 worth of commercial fertilizers in the hills, planted it in Cuba tobacco. The crop was sent to New York, and the net returns of sale amounted to \$320.90. In 1873 he added another acre, making two acres, and planted it again in tobacco. The crop of two acres was sold in New York, and netted \$760. The two acres in tobacco did not interfere with the making of an abundant supply of provisions and the usual amount of cotton for market. What this resident has done any able-bodied, industrious immigrant may do, especially should he be so fortunate as to be blessed with a house full of children. Our pine-lands, of the quality producing the above results, may now be bought at from \$1 to \$3 per acre, upon accommodating terms of payment, and are rapidly becoming the most popular farming-lands in the county.

The Southwestern States do not grow tobacco as a market-crop. Tennessee returned, as the crop of 1869, according to the census, 21,465,452 pounds. Nine counties, which contributed more than two-thirds of that quantity, now report about 7 per cent. increase, or 15,820,000 pounds, grown on about 26,000 acres, and worth 6 cents per pound.

The following extracts are presented :

Sumner : The census of 1870 gives the crop of 1869 as 909,568 pounds. Since then at least two-thirds of that portion of the county that produced tobacco has been cut off, making us much less prominent in its growth. *Weakley* : The crop of 1873 was moderately good, but badly worm-eaten. Cotton-planting has to a great degree superseded tobacco-culture, and, consequently, what we do make does not receive the attention it did in years past. *Smith* : It is only because the tobacco-lands in the county are the most fertile in the world that they continue to yield the quantity and quality they do. Tobacco-growers here are noted for making no improvements of any kind, neither in horses, barns, fences, nor stock. *Robertson* : About one-fifth of the crop of 1873 is fine tobacco, and four-fifths inferior quality. The crop was seriously damaged by worms and drought. More of the crop planted on thin land than usual, owing to the wet May and June. The farmers got behind with their work, and could not manure the land or cultivate the crop as usual. *Wilson* : Rather an inferior crop; full one-half lugs and inferior leaf. *Dyer* : Quality good. Cotton has almost entirely superseded tobacco for the want of reliable labor. *Jackson* : Comparative quality equal to, if not better, than last year, where it was set out in time and properly cultivated, but not so good where it was planted late, because it had to be harvested before it was fully matured. *Obion* : Medium. Our county has nearly abandoned the raising of tobacco. For the last few years our farmers have given much of their attention to cotton. *Montgomery* : Good body; more worm-eaten than usual.

Tobacco is not a prominent crop in West Virginia. About 2,000,000 pounds are reported for 1869, of which nearly two-thirds were grown in Putnam, Kanawha, Fayette, Cabell, and Mercer, in the order named. A slight increase in estimates is apparent in the crop of 1873. Average price, as reported, 8 cents 4 mills. Kanawha has taken the place of Putnam as the first tobacco county, and has a good crop of medium quality. Putnam has declined, in consequence of reduction of prices, from 472,765 to 290,000 pounds, but the quality is rather better than average. The correspondent says that "the soil and climate of Putnam, especially that part of it lying in the Kanawha Valley, produces one grade of tobacco, black-wrapper, equal if not superior in quality to any part of the West; at every tobacco fair held in Cincinnati the black-wrapper grown in this county took all the premiums that were offered for that grade."

Kentucky stands at the head of tobacco-growing States in respect to quantity. Returns from forty-three counties which reported 75,294,305 pounds in 1869, of the total return of 105,305,869 pounds, now return estimates of last year's crop, aggregating 109,050,475 pounds, grown on 150,214 acres, and valued at 6 cents per pound. These counties represent above 70 per cent. of the production, and if the remaining counties have made a similar increase, the total for Kentucky would be about 140,000,000 pounds. The following extracts are made:

Taylor: A loss of 10 per cent. in quality, owing to unfavorable season. Early part of season too wet, and latter part too dry, making the crop gummy and bitter. *Fleming*: The quality of soil, and experience and care in culture and harvesting makes it comparatively good. *Hardin*: The quality is below an average, and was attributable to drought and an unusual number of worms, together with a not sufficient amount of labor to cultivate it properly. *Hart*: The worms were very destructive to the crop last year, being more numerous than ever before known; hence there is a very large proportion of the crop of 1873 that is of inferior quality. *Graves*: Quality not so good as last year by 3 per cent.; damaged by worms. *Carroll*: Inferior in quantity and quality, owing to the late planting and drought. *Meade*: Too much rain in fore part of season and drought; grasshoppers also injured the crop. *Edmonson*: Light and short; too wet in the spring and early part of the summer. *Boone*: Good, when planted early, well taken care of; bad, when planted late, badly cultivated and handled. *Pendleton*: Quality poor; drought and lateness of setting. *Breckinridge*: The quality will rank about 90 per cent., it being lighter than usual, which is ascribed by the planters to the drought in the latter part of the season. *La Rue*: Inferior; caused by worms, and unpropitious weather during the season of growing. *Logan*: Leaf very fine and large; larger proportion of seeds than usual, owing to rainy weather in the spring, and to the destruction of worms in September. *Hopkins*: Second rate, owing to early wet season and the ravages of worms. *Daviess*: Decidedly inferior; too much rain during early season, and great drought afterward; crop fully 25 per cent. less than in 1872. I have a complete statement of the names of purchasers and shippers of the crop actually grown in the county in 1872, with the amount purchased by each person in pounds, from their books, and, enormous as it may seem, the amount reaches 12,057,000 pounds; this I know to be reliable. *Christian*: Medium; occasioned by worm-cut and partial drought. *Kenton*: Medium; caused from the season of planting and early drought. *Union*: Indifferent; caused by worms and wet weather. *Hickman*: Heavier, but more lugs; caused from heavy rains during planting-season and drought afterward. *Ballard*: Extremely cold, dry spring; grasshoppers and other insects destroyed plants; worms and wet weather caused the crop to be small and of inferior quality. *Casey*: Generally good; somewhat injured by bad handling and curing. *Warren*: From 8 to 10 per cent. better than 1872; very fine season last fall. *Callaway*: Barely average; wet spring, dry summer, and worms. *Webster*: Not a medium crop on account of the drought and worms. *Simpson*: Tolerably good; soil not richly adapted to tobacco. *Cumberland*: Medium; caused by careless handling. *Owen*: Hardly an average crop in quality, but above an average in weight; not so good as usual, because it cured imperfectly on account of the wet season. *Shelby*: The quality of tobacco is peculiar to the soil upon which it is grown. The growth of timber indicates the qualities of tobacco expected to be grown; for instance, white-oak and hickory produces the cutting-leaf; average yield per acre 500 pounds. Sugar-tree and beech, the latter growth predominating, produces what is known as light-wrappers; average yield per acre, 750 pounds. Sugar-tree, black-walnut, ash, interspersed with scattering beech, produces the heavy manufacturing leaf; aver-

age yield per acre from 1,000 to 1,100 pounds. *Green*: Medium crops, but injured by worms. *Adair*: The bulk of the crop is light, wants body and weight, and is inferior in point of quality. Heavy tobacco, made on old ground, sells well. *Bracken*: Comparatively good; injured to some extent by the dry weather immediately after and during the latter part of the planting-season, and a little by early frost. *Harrison*: Generally second rate, strong, heavy tobacco; our hill-lands only cultivated in tobacco. I believe there was more raised in 1873.

In Ohio, Montgomery stands first in production, in the census of 1870, among tobacco counties, returning more than one-fifth of the aggregate quantity in the State. Ten counties, which were credited with nearly two-thirds of the State product, now report more than that aggregate, or 19,952,263 pounds. The comparison, however, with assessors' returns for 1869 would not show an advance. The crop of Montgomery in 1872 was 8,178,543; the estimate for 1873 is the same.

Montgomery: The quality is of an average compared with past years; causes of good quality are, plenty of fertilizers, favorable seasons, good cultivation, hanging it on twine or hooks, good sheds, and good weather for curing. The causes of bad peculiarities or qualities are, planting on poor land, hanging on sticks by splitting the stalks, letting it get too ripe before harvesting, dry weather during curing process. *Brown*: Good. The tobacco of this county sells in Cincinnati at this time higher than any tobacco from the West. We have a limestone soil well adapted to the raising of tobacco. *Darke*: Pretty good. Raisers having acquired experience, it is better handled. *Monroe*: Not quite an average in quality, on account of being planted late and growing slowly during the month of August. *Morgan*: A full average as to quality. *Belmont*: Generally good. *Preble*: Good; season was favorable, and no hail or other casualties. *Adams*: The quality is about average, the white tobacco very good. Causes of bad quality are late planting, sun-burn, and a few crops frosted. *Edwards*: Good quality, but worm-eaten. A portion of the crop was abandoned to save the rest. *Franklin*: Medium. Great want of suitable buildings for curing purposes.

ILLINOIS.—*Pulaski*: Medium. Land good, but attention poor. *Wayne*: Fair. Injury was caused by worms being worse than common. *Williamson*: The quality was rather inferior, owing to drought. *White*: Better than average.

Returns from Missouri show an increase of about 35 per cent. over those of the census. The following extracts are made from the reports:

Saint Charles: Not as good as the crop of 1872, on account of drought in the setting-out season, and the abundance of worms. *Monroe*: Quality and yield poor—33½ less than an average, on account of an unusual protracted drought and early frost. *Franklin*: Below average because of drought and insects; also a failure of interest in its culture. *Howard*: Inferior. The drought and early frost injured the crops generally. *Carroll*: Poor; one-half badly frosted. *La Fayette*: Ordinary to indifferent; cause, dry season. *Ray*: Light in weight, but good color; caused by the dry season.

Tobacco is not a prominent crop in Wisconsin, being grown mainly in Rock and Dane Counties. The former, which is credited with 645,508 pounds in 1869, now returns 2,800,000 pounds, grown on 2,400 acres, and worth 4 cents 7 mills per pound.

The following is a summary, not of estimates of all the tobacco grown in the State, but the aggregate quantity reported, and the aggregate reported by the last census for the same counties:

States.	Pounds, census of 1870.	Pounds, estimated for 1873.	Number of acres, 1873.	Price per pound, 1873.	Value.
				<i>Cents.</i>	
New Hampshire.....	151, 189	200, 000	150	15	\$30, 000
Massachusetts.....	7, 289, 775	7, 875, 000	3, 220	11. 4	475, 500
Connecticut.....	7, 410, 177	7, 750, 000	4, 639	22. 3	1, 727, 500
New York.....	1, 884, 048	2, 324, 730	2, 387	10. 3	167, 462
Pennsylvania.....	2, 843, 956	14, 575, 200	12, 146	13	1, 778, 868
Maryland.....	9, 103, 690	11, 372, 000	12, 930	9. 1	925, 040
Virginia.....	24, 802, 192	32, 345, 107	54, 316	7. 8	2, 530, 967
North Carolina.....	8, 666, 948	8, 600, 870	15, 783	8. 9	765, 358
Florida.....	118, 799	50, 000	80	38	19, 000
Tennessee.....	14, 823, 916	15, 820, 000	26, 058	6	960, 700
West Virginia.....	1, 326, 238	1, 384, 925	1, 517	8. 4	116, 642
Kentucky.....	75, 294, 305	109, 050, 475	150, 214	6	6, 187, 517
Ohio.....	11, 943, 728	19, 952, 263	21, 720	5. 8	1, 162, 122
Indiana.....	4, 530, 601	7, 485, 000	9, 469	4. 4	353, 075
Illinois.....	2, 506, 771	2, 686, 952	2, 922	4. 9	133, 062
Wisconsin.....	645, 508	2, 800, 000	2, 400	4. 7	131, 600
Missouri.....	3, 476, 176	4, 678, 004	6, 506	5	234, 215
Total.....	170, 818, 017	248, 950, 526	326, 457	.....	17, 698, 628

The above summary is made from local returns, as follows :

County.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
				<i>Cents.</i>	
NEW HAMPSHIRE—Cheshire.....	151, 189	200, 000	150	15	\$30, 000 00
MASSACHUSETTS—Franklin.....	2, 473, 265	3, 000, 000	.....	12	360, 000
Hampden.....	1, 095, 923	1, 155, 000	770	10	115, 500
Hampshire.....	3, 720, 587	3, 720, 000	2, 450	.....	.....
Total.....	7, 289, 775	7, 875, 000	3, 220	11. 4	475, 500
CONNECTICUT—Tolland.....	531, 399	750, 000	500	25	187, 500
Litchfield.....	1, 048, 569	1, 000, 000	900	10	100, 000
Hartford.....	5, 830, 209	6, 000, 000	3, 239	24	1, 440, 000
Total.....	7, 410, 177	7, 750, 000	4, 639	22. 3	1, 727, 500
NEW YORK—Steuben.....	150, 540	124, 730	387	14	17, 462
Chemung.....	475, 905	700, 000	500	(*)	.....
Onondaga.....	1, 257, 693	1, 500, 000	1, 500	10	150, 000
Total.....	1, 884, 048	2, 324, 730	2, 387	10. 3	167, 462
PENNSYLVANIA—Bucks.....	151, 372	891, 600	743	.....	.....
Lancaster.....	2, 692, 584	13, 683, 600	11, 403	13	1, 778, 868
Total.....	2, 843, 956	14, 575, 200	12, 146	13	1, 778, 868
MARYLAND—Prince George.....	3, 665, 054	4, 500, 000	7, 000	9. 5	427, 500
Charles.....	2, 102, 739	3, 500, 000	5, 000	7	245, 000
Montgomery.....	630, 000	650, 000	930	8	52, 000
Saint Mary's.....	2, 522, 917	2, 522, 000	.....	7	176, 540
Howard.....	182, 980	200, 000	.....	12	24, 000
Total.....	9, 103, 690	11, 372, 000	12, 930	8. 1	925, 040

* Not sold.

County.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
				<i>Cents.</i>	
VIRGINIA—Franklin	1,696,549	3,000,000	4,000	10	\$300,000
Buckingham	809,937	1,012,921	1,352	6 ³ / ₈	67,101
Brunswick	1,121,480	841,110	-----	5	42,055
Nelson	1,199,182	1,125,000	1,650	8 ¹ / ₂	95,625
Pittsylvania	4,282,511	4,600,000	10,000	8	368,000
Campbell	1,761,901	2,418,400	3,023	8	193,472
Botetourt	196,459	500,000	1,250	10	50,000
Louisa	930,226	1,500,000	2,000	6 ¹ / ₂	97,500
Spotsylvania	132,502	700,000	1,500	7	49,000
Floyd	157,467	200,000	2,857	10	20,000
Charlotte	1,964,736	1,600,000	(*)	6	96,000
Prince Edward	960,700	1,400,000	2,000	7	98,000
Lunenburg	963,673	855,000	2,100	6	51,300
Albemarle	1,781,619	2,000,000	1,600	6	120,000
Rockbridge	186,469	200,000	400	6	12,000
Mecklenburgh	2,166,628	3,000,000	5,000	7	210,000
Patrick	323,886	442,676	1,884	8	35,414
Chesterfield	194,510	200,000	400	7 ¹ / ₂	15,000
Goochland	405,215	700,000	2,350	7	49,000
Fluvanna	894,023	1,500,000	2,600	8	120,000
Caroline	417,843	800,000	1,000	12	96,000
Henry	1,129,617	3,000,000	6,000	10	300,000
Dinwiddie	844,504	550,000	950	5	27,500
Roanoke	280,550	200,000	400	9	18,000
Total	24,802,192	32,345,107	54,316	7.8	2,530,967
NORTH CAROLINA—Warren	751,045	500,000	600	9	45,000
Orange	530,442	1,000,000	-----	8	80,000
Surry	254,286	320,000	750	13	41,600
Forsyth	238,262	1,000,000	1,000	8 ¹ / ₂	85,000
Davie	247,555	480,000	800	10	48,000
Caswell	2,262,053	2,000,000	4,000	9 ¹ / ₂	190,000
Granville	2,134,228	1,422,819	5,340	8	113,825
Stokes	844,145	682,491	1,365	12 ¹ / ₂	85,311
Person	1,227,150	1,000,000	1,423	6	60,000
Guilford	177,782	195,560	500	8 ¹ / ₂	16,622
Total	8,666,948	8,600,870	15,783	8.9	765,358
FLORIDA—Gadsden	118,799	50,000	80	.38	19,000
TENNESSEE—Sumner	909,568	300,000	700	4.5	13,500
Weakley	2,599,590	1,000,000	2,000	7	70,000
Smith	2,250,202	3,500,000	4,375	6	210,000
Robertson	2,103,322	2,500,000	4,166	7	175,000
Wilson	332,901	400,000	667	4	16,000
Dyer	412,440	100,000	100	8	8,000
Jackson	713,578	1,300,000	1,800	5	65,000
Obion	645,937	220,000	250	6	13,200
Montgomery	4,856,378	6,500,000	12,000	6	390,000
Total	14,823,916	15,820,000	26,058	6	960,700
WEST VIRGINIA—Putnan	472,765	290,000	400	8	23,20
Mercer	117,429	200,000	200	10	20,000
Kanawha	412,469	549,925	367	10	54,992
Cabell	135,410	250,000	450	7	17,500
Fayette	188,165	95,000	100	10	950
Total	1,326,238	1,384,925	1,517	8.4	116,642
KENTUCKY—Hickman	570,287	1,000,000	1,800	5	50,000
Robertson	1,648,200	2,713,700	3,800	7	189,959
Crittenden	1,970,776	2,371,822	-----	-----	-----
Ballard	2,863,455	954,485	700	8	76,358
Casey	145,982	250,000	-----	3	7,500
Warren	2,035,139	2,071,800	4,160	4.5	93,231
Marshall	1,416,282	1,782,726	1,782	7	124,799

* Not ascertained.

Counties.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
<i>Cents.</i>					
KENTUCKY—Callaway	1,924,502	2,500,000	5,000	5	\$125,000
Hancock	1,679,384	2,096,580	2,995	5	104,829
Webster	3,511,649	5,500,180	7,850	5	275,009
Muhlenburgh	1,821,988	2,000,000	4,000	6.5	130,000
Simpson	1,072,401	1,200,000	2,000	7	84,000
Cumberland	1,304,366	1,265,435	1,700	8.5	107,561
Owen	2,890,670	4,000,000	5,000	6	240,000
Shelby	240,435	275,000	370	6	16,500
Henry	1,375,364	2,089,090	2,611	-----	-----
Green	1,375,091	1,912,200	2,400	7	133,854
Adair	1,231,665	1,800,000	2,500	4	72,000
Bracken	4,188,039	5,000,000	5,000	10	500,000
Harrison	281,704	1,702,370	2,000	-----	-----
Union	2,096,260	4,450,000	5,000	4.7	209,150
Butler	1,008,582	1,000,000	-----	6	60,000
Kenton	360,983	800,000	1,600	6	48,000
Hopkins	3,012,053	5,000,000	6,500	5.5	275,000
Daviess	6,273,067	9,000,000	12,000	5.7	513,000
Christian	5,384,137	15,000,000	30,000	6	900,000
Oldham	301,285	350,000	400	7	24,500
Grayson	859,760	1,500,000	2,500	4.7	70,500
Trimble	688,465	1,351,930	1,400	6.5	87,875
McLean	2,262,037	3,636,565	5,196	6.5	236,376
Logan	2,707,571	4,332,112	7,220	5.8	251,262
La Rue	368,100	800,000	1,600	4.7	37,600
Boone	279,740	348,500	410	5	17,425
Pendleton	1,651,593	3,000,000	4,000	5	150,000
Breckinridge	3,338,471	3,500,000	-----	6.2	217,000
Graves	4,774,195	6,000,000	8,000	6.5	390,000
Carroll	669,875	400,000	800	8	32,000
Meade	539,000	596,000	-----	6.5	38,740
Fleming	305,954	499,980	600	8.5	42,493
Hart	2,315,212	2,500,000	3,570	5	125,000
Livingston	1,086,578	900,000	450	5	45,000
Taylor	1,209,830	1,300,000	2,600	5	65,000
Hardin	284,178	300,000	700	7	21,000
Total	75,294,305	109,050,475	150,214	6	6,187,517
OHIO—Brown	2,687,743	2,972,019	4,095	12	356,642
Darke	167,989	300,000	-----	6	1,800
Monroe	2,845,525	3,090,000	4,285	3	90,000
Montgomery	3,963,183	8,178,543	8,475	6	490,712
Athens	207,839	147,227	277	4.6	5,889
Vinton	110,739	152,621	173	4.7	7,173
Washington	1,041,125	2,293,367	2,386	3.5	80,267
Morgan	486,125	1,300,000	-----	3.7	58,100
Adams	102,473	120,000	250	10	12,000
Preble	330,987	1,488,486	1,779	4	59,539
Total	11,943,728	19,952,263	21,720	5.8	1,162,122
INDIANA—Vanderburgh	167,150	250,000	294	5	12,500
Pike	1,119,356	2,000,000	2,500	4	80,000
Perry	224,125	235,000	425	4.5	10,575
Spencer	3,019,970	5,000,000	6,250	5	250,000
Total	4,530,601	7,485,000	9,469	4.4	353,075
ILLINOIS—Pulaski	157,000	50,000	70	7	3,500
White	135,045	80,000	100	4	3,200
Edwards	133,150	205,000	292	6	12,300
Franklin	387,382	415,000	560	6	24,900
Wayne	541,605	400,000	500	5	20,000
Williamson	1,152,589	1,536,952	1,400	4.5	69,162
Total	2,506,771	2,686,952	2,922	4.9	133,062
WISCONSIN—Rock	645,508	2,800,000	2,400	4.7	131,600

Counties.	Pounds, census of 1870.	Pounds, estimate for 1873.	Number of acres, 1873.	Average price per pound, 1873.	Value, 1873.
				<i>Cents.</i>	
MISSOURI—Monroe	187, 091	803, 000	1, 600	3. 5	\$28, 000 00
Saint Charles	146, 754	146, 946	.....	7. 7	11, 314 00
Ray	190, 355	250, 000	333	3	7, 500 00
La Fayette	113, 735	75, 000	90	3	2, 250 00
Lincoln	891, 737	650, 000	800	7	45, 500 00
Stoddard	118, 534	108, 000	75	4	4, 320 00
Carroll	256, 578	1, 000, 000	1, 428	3. 2	32, 000 00
Howard	788, 132	943, 758	1, 500	3. 5	33, 101 00
Franklin	783, 270	702, 300	380	10	70, 230 00
Total	3, 476, 176	4, 678, 004	6, 506	5	234, 215 00

This showing indicates an increase of 41 per cent. over the census figures of 1869; and if the same proportion of increase may be assumed for what is not here represented, it points to a crop of about 370,000,000 pounds.

FOREST-CULTURE IN THE AUSTRIAN COAST PROVINCES.

From a report prepared by Simon Scharnaggl, royal inspector of forests in Trieste, and published by the Austrian Ministry of Agriculture, it appears that the destruction of forests upon the Adriatic is clearly recognized as the cause of the frequent droughts, failing harvests, and consequent poverty of the people of those regions. The total area of the coast provinces is 1,385,476 joch,* or 1,970,562 acres. About 23 per cent. of this area is designated as "*Karst gründe*;" that is, land incapable of plow-culture on account of its irregularity of surface. For many years the Austrian government has been anxious to restore the luxuriant forest-growth that once covered this class of lands, as well as to re-afforest other portions of these provinces. In 1857 the mayor of Trieste planted a tract of barren Karst near Brassovizza with Austrian pine at a considerable expense, but with entire success. Other partial experiments demonstrated the practicability of re-afforesting the Karst. In 1864 the imperial government commenced systematic operations by appointing local directors and by establishing nurseries for the growth of young trees. Serious embarrassments were felt from the lack of practical knowledge in these local directors, and in numerous failures in obtaining tree-plants; but by the concentration of tree-raising at a few central nurseries, and by profiting from the lessons of experience generally, the enterprise has become quite promising.

A powerful impulse was given to the movement by a convention of Austrian foresters in 1865, who, after a thorough examination of the Karst, came to the conclusion that the whole of this region was capable of improvement, and that the forests would re-appear in a few years if the ravages of live stock and wood-choppers could be restrained. They appealed to government for aid, and proposed several judicious measures to secure the right kind of trees for replanting and the right methods of culture. The government responded to this petition in 1868

* A joch is 1.4223 acres.

by the appointment of a professional forester and by the establishment of nurseries of forest-trees. Of these, two were established at Mount Sermin, and one at Gortz for deciduous trees, and one at Rodik, 1,600 feet above sea-level, for conifers. These nurseries have furnished an ample supply not only for the karst, but also for portions of the Crown lands in other regions. Their production during four years was as follows:

Year.	Conifers.	Deciduous trees.	Mulberry and fruit trees.	Total.
1869.....	813, 100	543, 700	48, 300	1, 405, 100
1870.....	1, 892, 800	1, 918, 000	178, 400	3, 989, 200
1871.....	3, 302, 666	6, 806, 266	370, 660	10, 479, 292
1872.....	3, 909, 466	6, 247, 676	660, 599	10, 817, 241
Total for four years.....	9, 918, 032	15, 515, 636	1, 257, 959	26, 690, 831

These trees were furnished to the royal foresters superintending different sections of the Crown lands, and sold at cost to individuals and communities applying for them. They are also furnished gratis to private parties who promise to use them for public benefit. Two and a half million of trees have already been set out, and the demand transcends the supply. All the Crown lands have applied for trees and for instruction in replanting.

The coast-nurseries are best for deciduous trees, giving them a longer season of growth without risk of injury from the winter. Many sorts make a growth sufficiently rapid to plant the second year. Locusts average in one year a height of 3 feet; rock maples, 1 foot; ashes, lindens, and elms, from 6 inches to a foot; fruit-trees, from 1 to 3 feet, with well-developed roots. Deciduous trees are more vigorous than conifers, especially in the Karst, where the bora and sirocco prevail. They are also less liable to injury from pasturing and from fire.

Among deciduous trees the oak, the elm, and the ash have been found to be the most vigorous growers; among conifers the Austrian pine is the most eligible. The latter, though an excellent shelter and timber tree, is not a favorite among forest-growers.

The Karst region, embracing 284,870 acres according to the tax-rolls, is mostly owned by the townships, but a small proportion being in private hands. The lands are mostly used for pasture, and are closely grazed by the numerous flocks and herds, which furnish almost the sole income of the inhabitants outside of the vine-growing districts of Gortz and Volusca. The Austrian pine having been found unfavorable to the growth of grass, the people of the Karst have conceived a special aversion to it. In 1872 several townships taxed themselves to re-afforest their lands, but stipulated that only ash-trees should be planted. They stated that they could not wait eighty years for the Austrian pine. They received 70,000 ash-trees, not one of which appears to have died. The pine and larch (*Abies pectinata* and *Larix Europæa*) have proved to be well adapted to the higher regions, within the zone of the red beech, ranging from 1,800 to 4,000 feet above sea-level. Below these limits the elm and flowering-ash seem to combine the qualities that enable them to resist both storm and drought. The last named is excellent for vine-poles and wagon-timber, but its leaves are inferior to those of the common ash for fodder, inasmuch as they contain too much tannin for cattle. The ailanthus was almost a total failure, but the box-maple (*Acer negundo*) and the Canadian poplar have succeeded very well. From 50,000 to 60,000 mulberry and fruit trees have been distributed with excellent results.

The severe droughts of the Karst region are unfavorable to the growth of tree-seeds, except the chestnut, walnut, and others which admit of being planted deep enough to secure the requisite moisture. The best results have been obtained with Austrian pine two years old and deciduous trees one and two years old, set in holes a foot square and from 3 to 5 feet apart. A man can dig eighty to one hundred holes per day, and a woman can set four hundred to six hundred plants per day. Grass and weeds are beneficial in shading the soil and giving shelter from the wind. It is useless to raise mounds around the base of the trees, as the heavy rains wash them away. Fencing against live stock is desirable. The digging of the holes is paid for by a special tax, and the nurseries furnish all the trees necessary to fill them. Formerly each district was permitted to transplant its own trees, but the wretched manner in which this was done caused the government to take the supervision in its own hands and to employ only skilled laborers. The Karst is divided into four sections, each under the authority of a forester appointed by the government. The general direction, including the management of the central nurseries, is confided to an inspector residing at Trieste.

The foresters are appointed by the minister of agriculture on recommendation of the governor, and receive a salary of 1,200 gulden per annum, with an increase of 100 gulden every five years till the whole reaches 1,800 gulden. They are also allowed rations and traveling expenses. Their duties embrace the enforcement of the forest laws, and the regular visitation of the forests according to a plan devised by the governor and the local authorities. They are also to assist private enterprise as far as possible, and to use their utmost influence to extend forest-culture. They are expected to watch closely, and frequently report the practical workings of the measures taken for re-afforesting the country; to lay out, build, and control timber-slides; to give instruction in forestry; to prepare estimates for the local government, also tables of statistics and blanks for local officers; to superintend all forest operations, including nurseries; to keep a record of their action; to prepare estimates for the government, and to give all practical information on forestry to private individuals and societies. The system contemplates not merely a routine official action on the part of these officers, but also an intelligent and spontaneous co-operation with every effort that shall be made by all parties for re-afforesting the country. Subordinate foresters are appointed to carry out their measures and to perform the details of forest duty.

Forest legislation and the administration under it have become already a very considerable branch of jurisprudence of a very practical character. It has not yet been found necessary to use compulsory measures, as the spontaneous demand for forest-culture has so far exceeded the means provided by the government; yet a few districts refuse to have anything to do with it. The policy of the ministry is to bring all steep slopes and all bare places under the jurisdiction of the foresters, for the purpose of replanting them in woods. The forests already standing are under close supervision, and many wasteful abuses have been corrected.

According to history and tradition, this whole Karst region was once covered with oak-forests. Previous to the twelfth century it furnished piles, ship and building timber for the republic of Venice during her brilliant maritime career. The previous spoiliations of Aquilegia, a prominent stronghold of the old Roman Empire, had but slightly affected the immense resources of the forests then existing. Venice plundered the Istrian forests systematically, and reduced that previously fertile

region to barrenness and poverty. An old description of the manor of Piffenburg states that a squirrel could travel for three miles along the Istrian coast upon the branches of trees; a few bushes now occupy the site of that luxuriant vegetation. The former fertile landscape is now replaced with naked cliffs and bare rocks, upon which an intense sunshine permits no springing plants. The numerous rivulets, dry for most of the year, become, during the remainder, roaring torrents, carrying the soil into the sea.

The denudation of these forest areas has been still more active in modern times. The plain of Volusca was stripped a hundred and fifty years ago. The oak ship-timber was carried to Fiume mostly for exportation to Italy. The red beeches are still numerous on the mountains. The woods in Castelnovo were destroyed during the current century. The red beeches being only valuable as fuel, were too remote from Trieste to be disturbed till all nearer supplies had been exhausted. At the close of the last century these woods furnished hiding-places for the bandit population, but the French invasion broke up their predatory habits, and they turned their attention to the destruction of their former forest covert, which is now nearly exhausted. The once dreaded dark beech wood of Tschitchen has disappeared, leaving but a few stakes on a barren, stony coast. But little is grown in the way of crops. The people have a great aversion to farm-labor, preferring a nomadic life, with a precarious support from teaming, charcoal-burning, &c. The women perform the small amount of farm-labor, and are in the degraded condition characteristic of semi-nomad populations.

The abrogation, in 1824, of restrictions upon the export of ship-timber, imposed for the benefit of the royal navy, caused the removal of the large trees from the coast regions by English and French merchants. In Istria, and in the Gortzer, and Trieste-Karst but little snow now falls, and great flocks of sheep and goats sweep all the young growing trees, except the cedars, and these are taken for fuel.

A special difficulty in re-afforesting the Karst region is found in the singular dryness of the soil. The underlying masses of chalk are split, seamed, and honeycombed with numerous cavities, through which the rain-water from the surface is absorbed. In some small tracts the nummulitic sandstone decomposes rapidly, leaving a surface stratum much more retentive of moisture than the chalk-beds. The leading character of surface-soil, however, is a red ochreous loam mingled with fragments of limestone, which dries out very rapidly. On the mountains and higher summer pastures may be found a dark-brown soil, largely composed of humus, the remains of ancient forest-growth, from which, however, the soluble mineral constituents have been removed. Exposure to sun and rain, since the destruction of the forests, has deprived this humus soil of its fertility, and crops can be raised from it only by copious mixture with the underlying ferruginous clay. Without this preparation neither grass-seed nor tree-seed will grow on it.

The lack of moisture cannot, here, be compensated by irrigation. The only river—the Recca—in passing the Karst region disappears in a subterranean channel at St. Cauzain, and re-appears at Duino, on the coast, as the Timavo. In long droughts water for domestic use is often transported several miles. The droughts usually begin in April and last till September, with the exception of occasional showers in August. Then the moist sirocco alternates with the desiccating bora, with intervening spells of agreeable weather. The spring bora, after damaging the fruit-bloom, frequently absorbs the entire moisture left by the winter. For forest-culture it is important that operations should

commence in early spring, before the last rains. But this is often difficult; the ground may be too wet, and if delayed till sufficiently dry the baking of the late muddy soil prevents the growth of both seeds and plants.

The Karst region, ten miles long, and embracing twenty-nine square miles, has but one small wood. A few bushes and alders scattered over naked, stony fields, are the only subsisting representatives of a once magnificent forest-growth. The soil has much strength, and if it could be protected against the destructive extremes of temperature, &c., it would soon be covered with vegetation. Its dry seasons are, however, especially favorable to vine-growth.

The leading kinds of timber indigenous to this region are the Turkey oak, (*Quercus cerris*), elm, (*Ulmus campestris*), and ash, (*Fraxinus ornus*.)

The last-named surpasses all others in tenacity of life under extremes of drought. In the Gortzer Karst the hop hornbeam (*Ostrya vulgaris*) and the common hornbeam (*Carpinus betulus*) are found. Three varieties of the maple, (*Acer campestris*, *A. pseudo-platanus*, and *A. platanoides*.) the linden, (*Tilia grandifolia*), and the red beech, (*Fagus silvatica*), begin at an elevation of 2,000 feet. Near Duino, on the coast, the holly-oak (*Quercus ilex*) and the *Celtis centralis* are frequently planted in the borders of the fields. Even on the poverty-stricken mountain-pastures the locust (*Robinia pseud-acacia*) and two species of poplar (*Populus nigra* and *P. pyramidalis*) have been successfully grown. Of fruit-trees, the walnut, (*Juglans regia*), the cherry, (*Prunus avium*), and the pear, (*Pyrus communis*), succeed best. The first two grow along the roads. The chestnut is very successful, especially near Volosca and Loverano. The white mulberry (*Morus alba*) is widely distributed. Sumac yields considerable material for tanning.

The rapid rise in the price of fuel presents great temptation to excessive chopping. Vine poles in 1870 were worth 3 florins per cental; in 1872 the price was 7 florins. Charcoal is largely manufactured in Castelnovo. The *Celtis australis*, a small tree, is largely exported for whip-handles and wagon-timber. It grows in the fence-corners, attaining a height of 7 or 8 feet. Such a tree is worth in Trieste from 2 to 2½ gulden. In spite of the scarcity of wood-growth there is a considerable export of fire-wood. The annual production of fuel in the Karst amounts to about two and a half millions of cubic feet, principally oak and red beech.

Of districts outside the Karst the first embraces the higher mountains, chiefly the bold and steep declivities of the southwestern part of the Julian and Carnian Alps. Its average elevation is 6,427 feet above sea-level, and it is well watered by springs. Yet even here the destruction of the forests has produced the same irregularity of rain-fall; the streams in winter become torrents, while in summer destructive droughts are frequent. The soil is especially favorable to conifers, but their growth is restricted by merciless chopping and by the grazing of goats, of which over 15,000 are kept in the mountains. The red beech mingles with the pines, firs, and larches in the higher portions. Lower down the rock-maple, elm, and ash begin to appear, and still lower the oak becomes the predominant type. The hazel and the barberry are common in the valleys. The land here is mostly in commons. Some small pieces are owned by the government. It has been found that its subdivision into individual proprietorships has been detrimental to the growth of wood. On the crown-lands and in a few private domains, forest-culture prevails; but elsewhere, the same reckless destruction is observable as in the Karst. Chopping is now forbidden during the

growing-season as well as the grubbing of stumps. The annual production of woods amounts to over 3,000,000 cubic feet, about half of the home consumption.

The second district, outside of the Karst, embraces Capo d'Istria, Pisano, and Pinquenty, with several neighboring sub-districts and some adjacent islands. The soil is deeper and less absorbent of water. The denudation of forest-areas here also manifests its mischievous consequences in the same irregularity of rain-fall as in other sections. The summer sun heats the bare and stony soil, producing a radiation which disperses the rain-clouds and causes destructive droughts. Anciently Istria was a fertile country, ranking next to Campania, for productiveness among the old Roman provinces. Then vast forests covered its hills, which remained comparatively intact till the middle ages. Venice, after the conquest of Pola, in 1150, A. D., extorted heavy supplies of piles, ship-timber, and fire-wood.

But the axe of the woodman was less destructive than the teeth of the goats, which were introduced by thousands into the forests. Their ravages were so serious that, in 1754 and 1760, Venice enacted that these animals should be destroyed on sight by the foresters; these enactments were but partially executed, and not less than 5,000 still roam over these depleted forests. A Crown-forest of oak in the fertile Quieto Valley has, by the annual floods of seventy years, received deposits of mud from 5 to 7 feet thick, greatly injuring the timber. This land yields but 6 florins per joch; as meadow it would yield 40. It should be exchanged for some of the denuded mountain-tracts. The oak is the prevalent type of tree-growth. On the mainland the durmast (*Quercus pubescens*) and on the islands the evergreen varieties (*Q. ilex* and *Q. cerris*) are found. Of these the first two are excellent for ship-timber. The common and cork oaks, (*Q. pedunculata* and *Q. suber*), the water-beech, (*Ostrya vulgaris*), and common hornbeam, (*Carpinus betulus*), are spread over the country; they grow slowly and furnish but indifferent timber and fuel. The mountain and field maples, (*Acer pseudo-platanus* and *A. campestre*), the flowering ash, (*Fraxinus ornus*), the cork-barked elm, (*Ulmus suberosa*), and the French maple are occasionally found. The undergrowth represents a southern flora, viz: wild olive, (*Phytrea angustifolia*), red-berried juniper, (*Juniperus oxycedrus*), &c. The locust (*Robinia pseud-acacia*) has been largely and profitably grown in old fields for vine-poles; it yields biennial crops more valuable than the best grain-crops. The ailanthus has been successful on only a few tracts. The derangement of the conditions of growth has also affected the habits of the people, indisposing them to farm-industry by its imperfect returns. They live chiefly by gathering wood and raising live stock, both of which pursuits are destructive of the timbered areas and intensify the influences which discourage agricultural production. The report complains of the number of ecclesiastics on the islands, numbering one for each two hundred and eight inhabitants, and exercising a deadening influence upon the industry and welfare of the people.

Forest-culture is here at a low ebb. The yearly product of timber per joch (1.4223 acres) ranges from 20 to 60 cubic feet; in the better managed state-forests the yield is 80 cubic feet and above. The wood is cut every 7 or 8 years on the mainland and every 8 to 12 on the islands. If the time were doubled the production would be much more than doubled. The law now forbids the cutting of timber during the flowing of sap, but close vigilance is required for its enforcement. Sheep and goats do more injury than the axe. The woodland is mostly owned by the township. The produce of the forests amounts to nearly 6,000,000 of cubic feet, about half the home-consumption.

The third district outside of the Karst is the plain of Turlani, which extends westward to the Italian frontier. This region, no less than the preceding, shows the effect of forest destruction. The rich soil is peculiarly adapted to deciduous trees; of conifers the *Pinus pinea*, formerly common, is now found only on the coast. Most of the land is devoted to cultivation, being held by large owners. The fuel necessary for the inhabitants is chiefly furnished by trimmings from vines, mulberries, and roadside trees. Willow-culture furnishes the basis of a profitable industry in basket-making. A joch of well-set willows will yield an annual cutting worth from 25 to 34 florins. On the coast a large area of unproductive sand-hills, subject to malaria, might be greatly improved in its sanitary character by the growth of poplars. In this vicinity a small village now represents the old Roman stronghold of Aquilegia, once called the second Rome.

FOREST-CULTURE IN FRANCE.

A recent report presented to the Central Society of Agriculture of France recommended the award of a gold medal to M. Jules Mion, President of the Tribunal of Commerce of Upper Marne, for the re-planting of forest-trees upon his estate, Val-Barisien. This tract, of 296 acres, is traversed by the little river Suize, with a channel about a mile long from south to north. The valley is very straight, and bordered in the south and west by rapid declivities which in summer were formerly parched by heat, and in winter denuded of their light top soil by rains. M. Mion first cut down the poplar and willow groves, which obstructed the current and favored inundations. He diminished the flow of the stream by weirs, removing the talus. Some hills previously used as sheep-pasture were first planted with resinous trees, which he made to grow by extra care in spite of the drought of 1846. He afterward cleared the valley of its rubbish and enlarged the river-bed, obtaining from 500 to 600 cubic meters of rich earth with which to reinforce the scanty soil of some portions of his farm. He continued his tree-planting not only upon the declivities but also the poorer portions of the more level land.

In 1869 the total area thus replanted amounted to 133 acres, of which 5 $\frac{1}{2}$ acres, planted in 1845, were of large and full growth. Over 70 acres planted at the same time had been several times destroyed by the illicit introduction of sheep, and hence had to be replanted. Resinous trees, twenty-two to twenty-six years old, presented stems 27 to 30 feet high and nearly 3 feet thick at the base, the soil being calcareous and poor, with a broken subsoil and a rapid southern declivity. The northern exposures, with an argilo-calcareous subsoil and a topsoil varying from 3 to 12 inches, showed a more active growth. It was not rare to find box-trees from 30 to 60 feet high with stems between 2 and 3 feet in circumference.

The trees selected were the *Pinus sylvestris*, the black pine of Austria, the *Epicea*, and the larch. They were first planted a little over a yard apart, or at the rate of about 4,000 per acre, but were subsequently thinned out to about double that distance apart. The ground was trenched with the plow for the seed, which was drilled. At first, M. Mion used plants three years of age, costing from 6 to 9 francs per thousand, but he subsequently planted the seed. His oldest plantations now give him enough seed to maintain or renew his plantations. The expense amounted to about 100 francs per acre, not including the ditching, which adds about 25 per cent. to the aggregate. The land before

planting rented at about 2 francs per acre, and its value was estimated by M. Mion at about 40 francs, or \$8 per acre. The improvements have raised the investment to 180 or 200 francs per acre. The owner, perhaps extravagantly, anticipates that in fifty years the value of the tract will have risen to 4,000 or 6,000 francs per acre, yielding a revenue of nearly 100 francs independent of the annual products of these plantations derived from clearings necessary for the development of the plants.

These tree-plantings have covered with a beautiful vegetation the rocks and hill-sides formerly so desolate. The city of Chaumont and the Baron Fraville have in the same manner embellished the country. M. Mion found strong opposition in his own tenant-farmer, on which account he took the cultivation into his own hands, replacing sheep with milch cows. He reduced the area under cultivation to about 165 acres, which he rendered much more productive by a judicious culture. By care in preserving manure and by the growth of forage-plants he was able to raise the wheat-crop to 26 or 27 bushels per acre.

From the results of this enterprise the inspector of forests of the arrondissement of Chaumont concludes that the bare, unproductive, and valueless hill-sides of the Upper Marne may be replanted with resinous trees, assuring a good return upon the investment. This opinion is indorsed by several of the most intelligent agriculturists of the Upper Marne.

CHEMICAL MEMORANDA.

BY WM. MCMURTRIE, CHEMIST.

All analysts who have had any experience in making determinations of tannic acid in different materials can, doubtless, very well appreciate the difficulties which have heretofore been met in securing results for which complete accuracy can be claimed, on account of the unsatisfactory character of the methods which have thus far been employed. Fully appreciating these difficulties myself, I have endeavored to devise a method which would, in a measure at least, remove the difficulties in question, and at the same time be free from all complication which might have a tendency to vitiate the results. Probably the most convenient method given in the works on chemical analysis for making these determinations is that of Löwenthal, described in Fresenius' Quantitative Analysis, fourth English edition, page 673, depending upon the oxidation, with a standardized solution of permanganate of potassa, of tannic acid and sulphindylate of potassa, and decoloration of the latter by means of this reaction.

In this method the tannic is extracted from the material with water, and in its use, therefore, there is great danger that the results may be vitiated by the presence of gum, sugar, &c., which are soluble in water, and which may also be oxidized at the expense of the permanganate of potassa, and it was with this difficulty that I was called upon more particularly to contend. In one of the varieties of wood I have examined, gum, as well as some coloring matters soluble in water, are present in considerable quantities. These substances are, however, to a great extent, insoluble in sulphuric ether, while the tannic acid is quite easily soluble in this menstruum. I have, therefore, made use of it in my

analyses. My method is as follows: After the material to be examined has been finely pulverized by grinding in a steel drug-mill, and thoroughly dried, it is digested several days with about twice its volume of sulphuric ether, the solution decanted, and the residue well washed with ether as long as anything may be removed. When this operation is complete, the solution and washings are united, and the ether removed by distillation. It may be collected by condensation for further use. The residue remaining from this distillation is treated with water until the final washings fail to produce any coloration with salts of iron, the entire solution thoroughly mixed and made up to a given volume. The solution thus obtained may contain very small quantities of coloring matter, which are seldom sufficient to be taken into account, but it is completely free from many of the troublesome impurities found in solutions made by extracting with water directly from the material.

Very nearly the same method has been applied by Julius Löwe* to the preparation of pure tannic acid from sumac. For this purpose he, however, makes use of acetic ether, and reverses the treatment; that is, he exhausts the material with water and removes the tannin from the solution by agitation with acetic ether, from which it is said the tannic acid may, by distillation of the ether, be obtained in a pure state. He recommends the use of acetic ether on account of its being less inflammable than sulphuric ether.

My attention was particularly directed to this subject by the receipt of samples of the wood of mesquite, (*Algarobia glandulosa*,) Osage-orange, (*Maclura aurantica*,) and live-oak, (*Quercus virens*,) from Mr. J. M. Wilson, Seguin, Guadalupe County, Texas. It was desired that the comparative value of these woods as tanning materials be determined, since it is believed that they contain considerable quantities of tannic acid. The different parts of the woods, which had been previously air-dried, were carefully separated and finely pulverized. They were then subjected to digestion with twice their volume of sulphuric ether for ten days in closed flasks. The solution was at the end of this time decanted and the method above described was followed throughout.

The analyses resulted as follows:

	Percentage of tannic acid.	Percentage of other material separated by ether, insoluble in water.
Live-oak, white-wood.....	0.30	0.90
heart-wood.....	0.125	2.505
Mesquite, heart-wood.....	6.21	0.60
white-wood.....	0.50	6.70
bark.....	0.50	1.84
Osage-orange, heart-wood.....	5.87	6.93
white-wood.....	0.30	4.90
bark.....	0.10	13.10

It will be seen from the above table that the heart-woods of the mesquite and Osage-orange contain tolerably high proportions of tannic acid; nearly as high, indeed, as many varieties of barks used in tanning,

* Fresenius Zeitschrift für Analytische Chemie, t. xii, p. 123.

and in the Southwest, where these trees grow abundantly, there is no doubt that they may be found of great value in this branch of industry. The live-oak contains so small a percentage of tannic acid that it will be found of little value. There was extracted from the Osage-orange a yellow resinous coloring matter, soluble in ether and caustic potassa, which we have not yet examined, but which we shall at some future time make the subject of an investigation. It is possible that it may be found useful as a coloring matter.

Experiments with beets.—In his experiments upon the effects of different fertilizers upon sugar-beets, the results of which have lately been published, Professor Goessman, of the Massachusetts Agricultural College, has found that beets do much better as a second crop upon soil to which farm-yard manure has been applied, the potash and other mineral elements of plant-food being then in a more favorable condition for assimilation by the root. He found that beets grown as a first crop upon land which had received an application of farm-yard manure gave a lower percentage of sugar than those grown under other conditions. The most favorable application seemed to be kainit and superphosphate of lime, or even sulphate of potassa alone.

In order to show the results of Professor Goessman's experiments in this particular, we append the following table exhibiting the percentage of cane-sugar found in the juice of roots grown from different seeds under the influence of various fertilizers.

Kind of fertilizer applied.	Freeport, Ill.	Sutton's English.	Electoral college-farm.	Vilmarin college-farm.
Fresh horse-manure.....	11.96	9.71	9.42	7.8
Blood guano, without potash.....	10.99	9.17	10.10	10.20
Blood guano, with potash.....	12.55	10.01	13.24	10.50
Kainit, with superphosphate of lime.....	13.15	10.91	12.16	10.50
Sulphate of potassa.....	14.52	12.47	14.32	12.78
No manure; second year after application of stable manure.....	13.49	.....	12.75	12.19

Deherain's late experiments prosecuted on the experimental farm connected with the school of Grignon, show results somewhat similar. Of all the fertilizers with which he experimented, principally phosphatic and nitrogenous, one manufactured by MM. Coignet, of Paris, containing 30 per cent. of dried bone phosphate, and 50 per cent. of dried animal matter, and yielding 6 to 7 per cent. of nitrogen, gave the best results. The yield was very much increased, and the beets contained an average of 12 per cent. of sugar. This result corresponds more nearly to the results obtained by Professor Goessman by application of blood-guano and potash, than those obtained by application of blood-guano alone. The fertilizer of Coignet, however, doubtless contained more phosphoric acid than the blood-guano employed by Goessman, and the increased percentage of sugar may be due to this fact. Or, since Deherain remarks that unfortunately for his experiment the soil at Grignon is very rich, it is possible that all the potash which was needed by the crop, and which had to be applied artificially by Goessman in his experiments, was supplied by the soil itself. We therefore consider it evident that this compound is necessary to the successful cultivation of the crop in question, and where it is wanting in the soil it should in all cases be contained in the fertilizer applied.

Extraction of crystallizable sugar from molasses.—In 1848 Dubrunfaut showed that the sugar contained in molasses was crystallizable and identical with ordinary cane-sugar. He then devised a method for its separation, depending upon the precipitation of the sugar with baryta, and decomposition of the insoluble sucrate of baryta thus formed by means of a current of carbonic acid gas. This method has been practically applied by M. Tillois, at Courriers, and as described by M. Boudard the method is as follows:

The molasses is treated with a concentrated solution of baryta, and the sucrate of baryta thus formed, after being allowed to settle, is separated from the supernatant liquor by decantation of the latter, mixed with a small quantity of water, and placed in large wooden vats, provided at the bottom with spiral tubes pierced with small holes. Carbonic acid gas is forced through these tubes and from them through the mass. The saccharine liquid, which is quite clear after the carbonate of baryta formed has subsided, is drawn off, and the carbonate of baryta freed from any remaining liquor by placing it in strong sacks, and submitting it to careful pressure. The clear saccharine liquid is then submitted to the ordinary processes of evaporation and crystallization, and the carbonate of baryta remaining at the close of the process is, by calcination, reduced to caustic baryta, and is then rendered fit for use in subsequent operations.

Strange growth of potatoes.—A curious fact with regard to the growth of potatoes is recorded by M. Charles Rabache, in which it appears that the tubers were planted in pure sand, in the bottom of a cave which was quite dark, and provided with little or no ventilation. When spring approached the tubers germinated, and after a given time small nodules appeared upon the roots, developing into tubers of fair size. The stems grew quite long, and were perfectly white except at the extremities, which were directed toward the opening, and therefore somewhat exposed to the action of diffused light. The tubers, though smaller, were in every way similar to the original, having the same color and taste, and showing the same composition upon chemical analysis, and the volume and weight of the entire product, stems and tubers, was three times that of the original tuber.

BOTANICAL NOTES.

BY DR. GEORGE VASEY, BOTANIST.

CIRCULATION OF SAP.—The most important contribution to our knowledge of this subject is a lecture of Prof. W. S. Clark, president of the Massachusetts Agriculture College, delivered before the Massachusetts State board of agriculture, at Fitchburgh, December 2, 1873. The lecture presents a concise summary of the principal theories and conjectures on the subject, details a series of carefully conducted experiments made at the college, and gives the author's conclusions thereon.

The lecturer premised a brief but clear statement of the structure and functions of plants so far as they relate to the subject in hand.

We condense and present below some portions of the lecture, which seem to be of the most general interest.

Numerous hypotheses have been advanced to account for the circulation of sap through the operation of some merely chemical or physical

forces, but their very multiplicity exposes their unsatisfactory character. Malpighi was of the opinion that the contraction and expansion of air in the ducts under the influence of heat and cold pumped up the sap, but this could not be without valves to obstruct its reflex action which do not exist, since they cannot be found, and since willow or rose cuttings will do as well with one end up as with the other. Moreover at the period of greatest pressure, there is often no air in the tree, but every cell and duct is gorged with sap, as has been fully shown in the experiments at the college.

Knight, without any good reason, assumed the pith-rays, extending from the center to the circumference of the stem, to possess irritability, and by their contraction and expansion to compress and dilate alternately the fibro-vascular tissue and so cause it to act somewhat like a force-pump.

Du-Petit-Thouars, rejecting all mere physical forces, advanced the hypothesis that the original force is a vital one, but that in the spring, after a period of repose, the buds under the influence of the sunshine, begin to expand, and by the absorption of sap, which they exhale, create a vacuum or suction which puts the fluids in motion throughout the entire plant. Exhalation and chemical changes, then occurring, keep up the flow till the fall of the leaves in autumn. This, however, entirely fails to account for the familiar fact that the sap is often pressing into trees, like the birch, with tremendous force, several weeks before there is the slightest activity in the buds.

Dutrochet discovered the principle called osmose, which causes unlike fluids separated by a thin septum to flow together with different degrees of rapidity. Thus, if a solution of sugar be separated, by a thin membrane from pure water, the water will pass through into the sugar freely, while a minute portion of the sugar will enter the water, the result being a large increase in the volume of the sugar solution. This force, under favorable circumstances, will overcome the force of gravitation so as to cause the rise of water in a tube to a considerable height.

The general principle of osmose has been almost universally adopted, without any considerable attempt at demonstration by physiological experiments, as the chief cause of all the motions which occur in the contents of vegetable cells, such as the absorption of water by the rootlets, the ascent of the crude sap to the leaves, and the general transference of all nutrient matters to the parts where they are deposited and assimilated. There are many difficulties in the way of accepting this charmingly simple hypothesis. Among these may be named the fact that there are found in the different adjoining cells of plants entirely distinct substances which do not mingle, as in the brilliant petals of flowers, where superimposed layers of cellular tissue contain fluids of unlike colors. The cambium, also, which evidently does not penetrate the sapwood, readily finds its way through hundreds of feet of its proper conducting medium. Again, the organic contents of plant cells are almost exclusively colloids, and the proof of their easy and rapid transmission through impermeable membranes is yet to be discovered; neither is there sufficient evidence of any such exudation of organic matter from the rootlets, where osmose is imagined to occur, as is required by all that is known of this principle in its operation upon lifeless matter.

Ordinary absorption and capillary attraction have been thought to assist in producing the phenomena of the motions of sap, though no one regards them as sufficient of themselves, since they not only lack the requisite power, but also that peculiar ability, manifested by the living plant,

to select from the soluble materials of the soil just those substances which every species needs for its peculiar constitution.

Herbert Spencer has attempted to demonstrate that the compression and dilatation of cells and ducts, caused by the swaying of stems and branches in the wind, is an important aid in promoting the flow of sap. When we consider that many trees grow where the wind scarcely affects them, and that plants flourish in glass-houses, where they are never disturbed in this way, we shall see that this hypothesis is of small account. There is also here, as in the hypothesis of Malpighi, a need of valves to prevent regurgitation, and we have during the present season demonstrated that detached living roots, entirely underground, exert an enormous force merely by their power of absorption.

In 1720 Rev. Stephen Hales, an English clergyman, made some experiments on the absorption and exhalation of water by plants, and on the force with which absorption was exerted. He applied mercurial gauges to several different grape-vines, and obtained, as the maximum pressure exerted by rising sap, a force sufficient to sustain a column of mercury 38 inches in height, which is equal to a column of water 43 feet high. To learn how far this might be true, and what were the facts concerning the spring flow of sap in our forest-trees, and especially in the sugar-maple, in regard to which scarcely any accurate observations had been made, we began some investigations at the agricultural college last March, the results of which may be summarily stated as follows:

A gauge was attached to a sugar-maple March 31, which was three days after the maximum flows of sap for this species, so that further observations are required earlier in the season to complete the record, and determine with certainty the maximum pressure which it exhibits in the spring. Of the record made the following facts are specially interesting:

First, the mercury was subject to constant and singular oscillations, standing usually in the morning below zero, so that there was indicated a powerful suction into the tree, and rising rapidly with the sun until the force indicated was sufficient to sustain a column of water many feet in height. Thus at 6 a. m., April 21, there was a suction into the tree sufficient to raise a column of water 25.95 feet. As soon as the morning sun shone upon the tree the mercury suddenly began to rise, so that at 8.15 a. m. the pressure outward was enough to sustain a column of water 18.47 feet in height, a change represented by more than 44 feet of water. On the morning of April 22 the change was still greater, requiring for its representation 47.42 feet of water. These extraordinary fluctuations were not attended by any peculiar state of the weather, and happened twelve days before there were any indication of growth to be detected in the buds. These observations are quite new, and as yet wholly inexplicable, but will receive further attention at a future time.

On the 20th of April two gauges were attached to a large black birch, one at the ground and the other 30 feet higher. The next morning at 6 o'clock the lower gauge indicated the astonishing pressure of 56.65 feet of water, and the upper one of 26.54 feet. The difference between the indications of the two gauges was thus 29.92 feet, while the actual distance between them is 30.20 feet, so that they corresponded almost precisely as if connected by a tube. In order to learn whether the same principle would prevail if the other gauge was moved, it was raised 12 feet higher. The same correspondence continued through nearly all the observations of the season, notwithstanding the gauges were separated by 42.20 feet of close-grained birch-wood. The sap-pressure continued to increase until, on the 4th of May, it represented a column of water

84.77 feet in height, which is believed be the highest pressure of vegetable sap ever before recorded.

To determine, if possible, whether any other force than the vital action of the roots was necessary to produce the extraordinary phenomena described, a gauge was attached to the root of a black birch-tree as follows: The tree stood in moist ground at the foot of the south slope of a ravine, in such a situation that the earth around it was shaded by the overhanging banks from the sun. A root was then followed from the trunk to a distance of 10 feet, where it was carefully cut off one foot below the surface, and a piece removed from between the cut and the tree. The end of the root, thus entirely detached from the tree, and lying in a horizontal position at the depth of one foot in the cold, damp earth, unreachd by the sunshine, and for the most part unaffected by the temperature of the atmosphere, measured about one inch in diameter. To this was carefully adjusted a mercurial gauge, April 26. The pressure at once became evident, and rose constantly, with very slight fluctuations, until at noon on the 30th of April it had attained the unequaled height of 85.80 feet of water. This wonderful result showed that the absorbing power of living birch-rootlets, without the aid of any of the numerous helps imposed upon them by ingenious philosophers, such as osmose, exhalation, dilatation, contraction, oscillation, capillarity, &c., was quite sufficient to account for the most essential of the curious phenomena connected with the circulation of sap. Unfortunately, in an attempt to increase the capacity of the gauge, the bark of the root was injured, and this most interesting experiment terminated. There can be little doubt that future trials, carefully conducted, with suitable apparatus, will achieve still more marvelous results.

The original experiment upon the grape-vine, the story of which has come down to us through a hundred and fifty years, was repeated May 9, and a pressure of 49.52 feet of water obtained May 24. This is 6½ feet higher than was observed by Hales.

The peculiar features of the pressure of the vine-sap are: Its lateness in the season; its apparent independence of the weather; its uniform and moderate rise day and night to its maximum; its very gradual decline to zero, without any marked oscillations; and its constant and almost unvarying suction of 4.5 to 6.5 feet of water manifested from June 20 to July 20, when the observations ceased.

In conclusion, we may as well admit that life is still a special force, and not to be resolved into any other sort or combination of attractions or repulsions, whether called electricity, osmose, or any other name.

There is, obviously, need of much more investigation and definite knowledge concerning the phenomena of vegetable nutrition and development; and it may be well to remember that we are everywhere surrounded by objects for scientific research, demanding our utmost talent, patience, and skill, but sure to give ample and profitable results to every diligent inquirer. We are often inclined to encourage ourselves to remain in ignorance and idleness by dreaming of grand opportunities for study in some far-off time or place; but let us all keep in mind the fact, so familiar to every thoughtful student of nature, that within the limited circle of our vision lie concealed more mysteries than with our best endeavors we can ever solve.

ROCKY MOUNTAIN GRASSES.—The collection of grasses made in the Rocky Mountains of Colorado, last year, by the botanists of Lieutenant Wheeler's expedition is the largest and completest, perhaps, ever obtained in that region; and although most of the species are well known to science,

there are some peculiar and interesting forms which are deserving of notice. The collection is quite full, also, in several difficult genera, and serves to increase and make more satisfactory our information respecting them.

One of the rarities of the collection is a very diminutive species of *Vilfa*, which may be characterized as follows:

Vilfa minima. Culms erect, branched at the base; spikes very slender, erect, terminal, and lateral; lateral ones partly included in the sheaths; flowers alternate, few, half a line long, pointed; glumes membranaceous, obtuse, about half as long as the flowers; palea nearly equal in length; stamens, three; leaves mostly radical, short, strongly nerved, lower sheaths inflated. This grass is from one to one and a half inches high, slender and delicate, and was found growing on wet shores around Twin Lakes, Colorado.

Sporobolus asperifolius, N. and M., occurs in a very luxuriant form, many of the specimens having 2-3 flowered spikelets. Many of these have the grain affected with a black smut, (*Tilletia caries*, Tul.) This seems to be an abundant grass in some localities. The genus *Calamagrostis* is represented in the collection by 5 species, viz, *C. Langsdorffii*, Trin.; *C. sylvatica*, D. C.; *C. stricta*, Trin.; *C. Lapponica*, Trin.; and *C. confinis*, Nutt. The last-mentioned species grows tall, and is cut for hay. The seed, however, is subject to an ergot, which differs, says Mr. C. H. Peck, from *Cladiceps purpurea* in its smaller size and in its color.

A few specimens of the delicate *Stipa Mongolica*, Turcz., were collected. It appears to be very rare. *Catabrosa aquatica*, Beau., was collected in wet bogs near Gray's Peak.

No genus of grasses gives more trouble to the botanist than *Poa*. Much confusion and uncertainty has prevailed as to the species of this genus in the Rocky Mountains. The specimens in the collection are very numerous, and embrace at least twelve well-marked forms or species, most of which are pretty well known in collections, some, however, under provisional names, and some others which probably have not yet been properly defined.

The following are some of the species as commonly received: *Poa arctica*, R. Br.; *Poa alpina*, L.; *Poa pratensis*, L.; *Poa cæsia*, Sm.; *Poa serotina*, Ehr.; *Poa sylvestris*, Gr.; *Poa flexuosa*, Muhl.; *Poa tenuifolia*, Nutt.; *Poa Andina*, Nutt. In addition to these is a species which approaches *P. brevifolia*, Muhl., but differs in some important particulars. The leaves are rather rigid, involute and cuspidate pointed. The cauline ones are very short, radical ones, 4-6 inches long. The culms are 1 to 1½ feet high, from running root-stocks. The branches of the panicle are mostly in pairs, slender, rather close and erect, flowering above the middle; the spikelets 3 to 4 flowered, flowers not webbed at the base.

A species described by Mr. Watson, in King's Report, under the doubtful name of *Poa alpina*, occurs in considerable quantity in the collection, and with considerable variety of form. It differs so materially from the Linnean species that it should have a distinct name. It seems to have a wide range, at elevations of 6,000-10,000 feet, and might very appropriately be called *Poa montana*.

The genus *Festuca* is represented by the following species: *F. tenella*, Willd.; *F. ovina*, L.; in several varieties; *F. microstachys*, Nutt.; *F. brevifolia*, Br.; and *F. scabrella*, Hook., and by another, numbered 406 in the collection, whose specific position is yet undetermined. It may be characterized as follows:

Festuca, No. 406. Spikelets cylindrical, lanceolate, acute, 3-5 flowered, 5-6 lines long; glumes membranaceous, shorter than the flowers, nearly

equal, lower one convex, not compressed, inner one slightly keeled, purplish, obscurely nerved; lower palet lanceolate, acute or short cuspidate, minutely scabrous, obscurely 5 nerved, convex, inner palet nearly equaling the outer, narrow, slightly hispid on the keels; anthers 3, linear. Radical leaves numerous, involute, 6 to 12 inches long, rough margined. Culms erect, $1\frac{1}{2}$ to 2 feet high; panicle, 3 to 4 inches long, loose; branches single or in pairs, naked below, erect.

Graphephorum flexuosum, Thurb., a handsome grass, occurs from Fort Garland, Colorado, as also a grass which approaches very near the same genus, but which seems to connect that with *Trisetum*. It might easily be mistaken for *Graphephorum melicoides*, but a close examination discovers the short awn on the back of the palet. A close examination of some specimens of *G. melicoides*, from near Mount Kineo, Maine, discloses also a short awn, though shorter than in these Rocky Mountain specimens. Other specimens of *G. melicoides*, from Canada, fail to show any awn. The question arises whether these short-awned specimens should be considered as belonging to *Graphephorum* or *Trisetum*. The Rocky Mountain specimens seem to be specifically distinct from those of Maine, and may, for the present, be characterized as follows:

Trisetum Wolfii, apparently cespitose, and from a running root-stock; culm erect, 1 to $1\frac{1}{2}$ feet high, smooth, culm leaves flat, short, ($1\frac{1}{2}$ to 4 inches;) lower leaves and sheaths somewhat scabrous, ligule lacerate; flowers in an upright close panicle, which is 2-4 inches long, 1-2 rays at each joint; spikelets lanceolate, 2-flowered, and with a rudiment or continuation of the rachis half as long as the upper flower; the rachis and rudiment villous hairy; glumes lanceolate, membranaceous, acuminate, equaling the flowers, which have a few hairs at the base; lower palet lanceolate, acuminate, slightly split or two-toothed at the point, obscurely 5-nerved, bearing near the point a straight appressed awn, equaling or a little exceeding the palet; upper palet rather shorter; grain oblong or linear, nearly as long as the palets. Collected at Twin Lakes, Colorado. A very similar, if not identical, species was collected in the Rocky Mountains in 1863, on the expedition of Major Powell, and distributed as 693 of Vasey's collection.

Some interesting forms of *Bromus* and *Triticum* occur, but are not yet sufficiently studied.

FACTS FROM OFFICIAL SOURCES.

BRITISH IMPORTS OF WHEAT AND FLOUR.—Official returns of imports into the United Kingdom show that the total import of wheat, in the two months ending February 28, 1874, was 7,208,729 cwts., of which the import from Russia was 1,250,594 cwts., a decrease of 1,177,313 cwts. from January and February of 1873; and from the United States, 4,454,942 cwts., valued at £3,050,974, an increase of 2,020,951 cwts. The increase in the United States imports of flour was from 160,227 cwts. to 713,989 cwts. Counting wheat and flour, the United States receipts in the two periods were, respectively, 5,325,773 and 10,949,852 bushels. The price of this wheat was equivalent, respectively, to \$1.79 and \$1.83 per bushel. For these periods, in which a small total increase is shown, the Russian receipts were reduced about one-half; those of the United States were doubled.

BLACK-LEG AMONG CATTLE.—The Department was recently addressed

by Hon. H. J. Jewett, of Ohio, in relation to the disease among cattle commonly known in this country by the name of black-leg or black-quarter, to which answer was given as follows:

DEPARTMENT OF AGRICULTURE,
Washington, February 23, 1874.

DEAR SIR: I am in receipt of your letter of 19th instant, in which you say that in some parts of the West a disease called black-leg, or black-quarter, is prevailing among cattle, and request information as to the character of the disease, the remedies for it, &c.

The reports of this Department have, from time to time, related facts concerning the ravages of a disease similarly called, and I have no doubt the same as that to which you refer. However, I think that no special treatise on the subject has been published, and at the same time those directly interested in the matter have been indifferent about communicating facts as to treatment, &c.

In view of the importance of the subject, I deem it expedient to be somewhat explicit in replying to your letter.

I find this disease referred to in a report of the commissioners appointed to inquire into the origin, nature, &c., of Indian cattle-plagues, published in Calcutta, 1871. Anthrax fever, locally known as goli, (quarter-ill,) is described as a sudden swelling of one hind-quarter, which extends over the loins, back, and shoulders. When the swelling is pressed it makes a cracking noise like pressing salt. The animal is very lame in the leg attacked. The respiration becomes very much accelerated, and the animal shows great distress, and is evidently in great pain. The administering of medicines appears now to be of no use. Even firing and cutting of the swelling produce no beneficial effect. When the swelling is cut the blood is all black and thick. When this disease breaks out among the stock the cattle are moved from place to place with a view to giving them exercise and preventing the lameness coming on; and by moving them about they have not time to eat too much. When they have been driven over ground where the pasturage is scanty there is less chance of the disease continuing among them. This disease does not occur every year, but when the grass is unusually rich and plentiful. If twenty animals are attacked by this disease, for example, they all die, and treatment is of no avail. The only way, says this authority, of preventing the spread of the disease is to keep the yet healthy animals moving about, giving them limited pasture.

In a "Manual of the More Deadly Forms of Cattle Disease in India," Calcutta, 1872, the disease, under the name of *anthrax fever*, is said to be a blood disease, and in India is said to be contagious, though in cold climates it is not believed to be so. It is generally accompanied with a swelling under some part of the skin, generally on the loins or hind or fore quarters or throat, and sometimes tongue. The disease has been found communicable to other animals, and to man in the form of malignant pustule. *Causes* are described as follows: When cattle which have for some time been kept on very poor, bare, or reedy pasture are put on rich grazing grounds they become very often affected. The younger cattle are especially liable to become affected, as in them blood is more rapidly formed than in older animals. The blood not only becomes suddenly enriched, but also vitiated, and escapes from its vessels in those soft parts of the body loosely connected. The most thriving animals are the most susceptible; especially those which are rapidly improving after having been in somewhat low condition. Again, at seasons when cattle are not sheltered at night, and the days are very hot and the nights cold, they are more liable to be affected.

Again, in this manual, it is said that, in certain badly-drained lands in Great Britain, the disease was wont to occur frequently; but since the lands have been duly drained, the disease is seldom or never met with. In some parts of the continent of Europe the disease is always more or less present, at certain seasons, on lands where the drainage is defective.

Concerning symptoms, it is said that the attack is very sudden. An animal, seen perfectly well a short time before, may be found in an hour or two afterward to be dull and stiff, and to have a difficulty in moving, and in a few minutes a swelling will be observed under the skin on some part of the body, generally on the loins, hind-quarters, fore-quarters, or throat and tongue; sometimes the disease may be located in the chest or abdomen, or even brain. If the throat and lungs are principally involved, then the breathing will be distressed. If the brain is affected, there will be stupor, and when the spleen and other parts of the abdomen become gorged, signs of abdominal pain will be evident. The respiration becomes very much increased, the animal moans, and the pulse is weak and rapid; the animal's strength soon fails, the external swellings rapidly increase, and death takes place in a few hours.

Treatment is of no avail when the swellings are large, or when from the distressed breathing it is evident that the lungs are very much gorged with extravasated blood. Preventive measures may be taken. If an animal is suspected to be attacked, purge

well, keep under shelter, and give good pure water, in which common salt may be mixed. When one of the herd is attacked, others will probably have a tendency to become affected; it is therefore advisable to give to each animal a laxative drench, and in their water a small quantity of salt and niter. All should be kept on bare pasture, and be made to frequently move about. It is also a good plan to insert a seton in the dewlap of each animal. This has been found to be a most successful preventive measure, combined with the change to bare pasturage; the new pasturage being of an easily digestible kind. The prevention of the disease is a most easy matter compared with the treatment of an affected animal; and by carefully preventing stock from becoming exposed to the causes already noted, seldom will the disease be found to make its appearance.

Thus far as to the disease in India, where it has much prevailed.

Youatt and Martin on Cattle, edited by A. Stevens, New York, edition 1855, treat of this disease at some length. They strongly advise bleeding to the utmost limit allowable, in connection with purging. But on this head, as it relates to bleeding, they do not agree with our Calcutta authority, by whom it is said that the propriety of bleeding is very questionable, and certainly can only be carried out in the very first stage of the disease, as the blood so soon becomes vitiated, turbid, tarry, and black in color that it will not run from the opened vein. Youatt and Martin are of the opinion that the prevention of this malady is the only cure worth notice; and to this end recommend that a piece of short or inferior *keep* should be reserved as a *digesting place*, in which the cattle may be occasionally turned to empty and exercise themselves. Those observed to advance very fast may be bled monthly for several months; but occasional purges of alterative medicines would prevent those diseases which seem to take their rise in over-repletion and accumulation, and are far better than bleeding.

Mr. G. Lawson, an English authority much approved by Allen, in his work on American cattle, says of the methods *first* to be resorted to, that bleeding is the first and principal remedy, and must be used in proportion to the age and strength of the animal; from three to four quarts will generally be found sufficient. After this the following purgative drink is recommended:

Carbonate of potash, 2 drams.

Sulphate of soda, 6 ounces.

Barbadoes tar, 3 drams.

Warm water, 1 pint.

Mix for one dose.

Setons in the dewlap are recommended.

In conclusion, I would cite the language of Mr. John Lawrence, England, in his treatise on cattle medicine, as quoted by Allen:

"It should be considered that animals living in a state of nature, regulated by the reason and experience of man, would be almost wholly exempt from disease; that their appetites, unlike our own, may be held under a constant control; that their diseases result purely from the negligence or erroneous treatment of their owners. They are either too much exposed to the rigors and changes of the weather, or they are gorged with food, denied a sufficient quantity, or supplied with such as is unwholesome. Here we learn the chief causes of their maladies. *Learn to prevent them*, instead of undertaking the tedious, unsuitable, and hopeless task of learning to cure them. Of all things, let the proprietors of cattle renounce forever the insane folly of offering premiums for *incurable* diseases, and the hope of providing medicines which, by a sort of miraculous operation, will enable men to continue in the habit of exposing their animals to the constant risk of such disease. Have no infallible receipts to offer; on the contrary, I wish to impress my readers strongly with the idea that all *infallible receipts* are *infallible nonsense*."

I am, very respectfully,

FREDERICK WATTS,
Commissioner of Agriculture.

Hon. H. J. JEWETT, M. C.

AGRICULTURAL EXPOSITION AT BREMEN.—Through the Department of State information has been received from the minister of the German empire that an agricultural exposition is to be held in the city of Bremen in June next. The exposition will be continued from the 13th to the 21st of that month, under the special protection of the Crown Prince of the German empire. The consul of the United States at Bremen remarks that the exertions made by the leading agriculturists of Germany, and the interest manifested generally, combine in promise to make the proposed exposition one of great value to agriculture—general and special.

+ BANANAS IN FLORIDA.—A correspondent says take up late bananas

and bank them ; the product finally is the largest and finest of the fruit. He says, in regard to banking, " Dig a large hole for the roots on a dry, sandy hill ; lay them down at an angle of, say 10° , the hole sloping upward for the tops ; lay the roots in the hole 4 to 6 deep, and cover with fine straw and about 4 inches of dirt.

DAIRY HUSBANDRY IN NORTHERN ILLINOIS.—The following statistics of associated dairying in the contiguous counties of McHenry, Kane, Kendall, La Salle, and De Kalb, Illinois, are condensed from a paper furnished by Mr. N. E. Ballou, of the county last named. Mr. Ballou represents that this form of associated industry has proved more profitable in that section than any other branch of farming ; that it is rapidly extending, and that while other branches have exhausted the soil and diminished its value, this, in addition to its larger direct profits, is recuperating the soil and rendering it increasingly valuable.

In McHenry County there are thirty cheese and butter factories, at which, during the season of 1873, 17,000,000 pounds of milk were manufactured into not less than 1,500,000 pounds of cheese and 100,000 pounds of "gilt-edged" butter. Estimated value of factories and fixtures, \$125,000 ; of cows, about 5,500 in number, \$275,000 ; of products for the season, \$180,000, or \$32.73 per cow.

Kane, twenty-two factories, using the milk of 10,500 cows ; product, 2,500,000 pounds of cheese and more than 1,000,000 pounds of butter. Invested in factories, \$100,000 ; in cows, \$525,000 ; value of products, \$400,000, or \$38.10 per cow.

In Kendall this industry has but just made a beginning, but will be largely increased in 1874. Two factories turned out last season something over 200,000 pounds of cheese and about 25,000 pounds of butter. Invested in factories, \$10,000 ; in cows, \$30,000 ; value of products, \$37,500. La Salle also has as yet but one factory, but is preparing to engage in the business extensively, and it is reported that several large factories are now in the process of erection. De Kalb has now fourteen associated and three private factories for the manufacture of cheese, besides two for butter. The number of cows furnishing milk for these is about 4,000. Mr. Ballou predicts that in the season of 1874 there will be not less than twenty associated factories in the county, using the milk of 7,000 cows. Invested last season in factories, \$50,000 ; in cows, \$200,000 ; value of products, \$125,000, or \$31.25 per cow.

Our correspondent reports, as ascertained by correspondence with the officers of the Wisconsin Dairymen's Association, that, in 1873, one hundred and fifty factories in that State turned out 10,000,000 pounds of cheese, and that factory-cheese manufactured in the Northwest has already attained in the great markets, both in this country and Europe, a deserved reputation for its excellent quality ; also, that the factory-butter of that section is especially sought after, for the reason that it is adjudged superior, as a rule, to that made in private families. He adds the important statement that a State dairymen's association is about being organized in Illinois, which will make it possible hereafter to collect full statistics of this industry in that State.

A HOPEFUL SIGN.—The young men of the South are learning self-reliance and the wisdom of co-operation for the accomplishment of results unattainable by single-handed effort. It is reported that in Franklin, parish of Saint Mary, La., ten or a dozen young mechanics, out of employ and unable to find work at their several trades, have contracted with Hon. T. J. Foster to cultivate jointly on his land eighty acres of cane, of which fifty are stubble and thirty seed-cane. The

conditions are as follows: Mr. Foster is to furnish the seed, implements, teams, and feed for the teams, and is to receive one-half of the crop when made.

TIMBER-GROWING IN LIVINGSTON COUNTY, ILLINOIS.—A correspondent reports that experiments in cultivating groves of soft maple have been successful in this county previous to the last two years; since then a borer has appeared, which increases so fast as to threaten to destroy all the young soft maples. It does not attack those which are more than five inches in diameter. The cultivation of hedges has been stimulated by the scarcity and high price of timber until there is a fair prospect that prairie-farms will soon be better fenced than those having plenty of timber on them. For hedges the Osage orange is deemed the best.

PRESERVATION OF GOVERNMENT TIMBER.—Public attention seems at last to be waking up to the importance of preserving timber, especially on the public lands, from the prodigal waste and reckless destruction to which it has long been subjected. A bill has been introduced into the legislature of Colorado Territory which provides that whoever shall, through intention or inexcusable carelessness, set fire to any forest, prairie, or other grounds within the Territory, "shall be deemed guilty of a high misdemeanor," for which the penalty shall be imprisonment in the penitentiary for a term not exceeding two years, and a fine not exceeding \$1,000. The person furnishing information of the violation of the law is to receive one-half of the fine collected, and the other half is to go to the school-fund of the county in which the offense was committed. It is further provided that the penalty inflicted on the offender shall not debar the person or party injured by his offense from a civil remedy for damages.

ABNORMAL WEATHER IN UTAH.—A correspondent at Salt Lake City reports that while the winter has not been severely cold in that locality, it has been remarkable for the prevalence of fog. Frequently it has prevailed continuously, night and day, for nearly a week at a time, during which all things and all creatures have been covered with rime. Nothing like it has occurred before during the twelve years he has resided there. He desires the learned in meteorology to explain the cause of such continuous fog at that altitude with its arid surroundings.

BLACKBERRIES IN NEW JERSEY.—One farmer in Monmouth County, who has six acres in Wilson blackberries, sold, last season, fruit to the value of \$3,000.

PROFIT FROM EGGS.—Our correspondent in York County, Maine, estimates that there are in that county 13,000 families, one-half of which are supposed to winter on the average 10 hens each, from which are gathered an average of 100 eggs per hen, which sell for 24 cents per dozen, amounting to \$130,000. As the women and children manage this business, he considers it a very good show for them.

PRODUCTIVENESS OF ALFALFA.—A farmer in Fresno County, California, reports that, in 1873, from a field of five acres he cut 20 tons of alfalfa hay, which netted him \$10 per ton; also one crop of alfalfa-seed, weighing 2,200 pounds, which netted him 20 cents per pound. This is a clear profit of \$123 per acre, though it is not stated that any allowance is made for interest on the value of the land or the exhaustion produced by the cropping.

BRADY AGRICULTURAL SOCIETY.—This society has its field of operations in Huntingdon County, Pennsylvania. The secretary sends to

this Department a statement of the yield per acre secured in 1873 by several of the officers and members: The president, J. B. Wakefield, produced, of wheat, 30 bushels per acre. The secretary, C. Wakefield, wheat, 27; corn, 95; potatoes, 340. The treasurer, David Detweiler, wheat, 24; corn, 98; potatoes 100. Jacob Sharp, wheat, 27; corn, 100. S. Sharp, wheat, 21; corn, 85. N. Hartzlar, wheat, 28; corn, 60. J. E. Odenkirk, wheat, 21; corn, 93. C. S. Brown, corn, 90; potatoes, 200.

A GOOD YIELD OF CORN.—A farmer of Virginia gives an interesting account of the method he pursued to secure a good crop of corn in Smyth County. He began on a very poor farm in 1859, of which he devoted $16\frac{1}{2}$ acres to corn. The yield was small. In 1866 he again planted in corn, with much better results. The tract was then turned over to grass, and mowed and pastured up to the winter of 1871-72. At this time manure from the barn was spread on the thinnest parts, and during the winter the field was plowed to the depth of 10 to 12 inches, after which slacked lime, to the amount of 80 bushels per acre, was applied, and the land harrowed five times, thoroughly mixing lime and soil. About May 1 the corn was planted in rows, $2\frac{1}{2}$ feet apart. When it came up about one bushel of plaster per acre was spread, and the spaces between the rows were thoroughly plowed to the depth of 12 to 13 inches. It was now thinned, leaving two stalks to a hill; replanting was done, and cutting "trash" from the hills with the hoe; no other work with this implement was done. From the 20th to 27th of June plowed with broad shovel-plows, and afterward with the long coulter-plow; thoroughly erased all traces of the shovel, except at the hills. In September, from 10th to 15th, cut up and shocked; and in December cribbed. Yield from the $16\frac{1}{2}$ acres, 1,500 bushels, or an average of $90\frac{10}{11}$ bushels per acre. Some acres of the field yielded as high as 125 bushels. Corn planted, white gourd-seed; soil, a clay loam, very well adapted to blue-grass, when in an improved condition.

A REMARKABLE YIELD OF CORN IN MARYLAND.—Mr. H. Vanderford, one of the editors of the Democratic Advocate, Westminster, Md., furnishes the Department a statement of a remarkable yield of corn, published in a recent number of his journal. The crop, said to be the largest ever produced in that county, was grown by Mr. John W. Murray, of Hampstead district, Carroll County, from whose letter the following extract is made:

The land is low and is overflowed by the washings from the turnpike and from my barn-yard, and was in grass for fifteen years prior to the spring of 1872: then plowed and planted in corn, and yielded $26\frac{1}{2}$ barrels per acre. This was the same piece of ground that I used last year. The stubble was left until I had planted the rest of my corn. On May 16, 1873, I plowed the ground very deep, harrowed it the same day, and rolled it on the 17th. I sowed 300 pounds fine bone and harrowed it again the same day. I marked it off, 32 inches one way, and sowed 200 pounds Rhodes's super-phosphate in the rows, and dropped the corn 10 inches apart, one and two grains in a hill. On the 4th of June it was badly missing; dragged the ground and replanted; 10th of June plowed again, still some missing; 17th of June plowed and hoed, and plastered the weak spots; 30th of June dragged, plowed, and thinned; 4th of July hilled with a potato-plow as deep as one horse could pull, and kept thinning as I thought required until shooting-time. The variety of corn was the Chester County mammoth yellow, of which I send you a sample.

In regard to the yield, the ground was surveyed by a practical, sworn surveyor, cut off by two sworn men, and measured by a sworn man, in the presence of many, and measured $29\frac{7}{10}$ barrels,* and the same measured at the cattle-scales in Baltimore made $30\frac{1}{2}$ barrels, for which I hold a receipt.

I am not a one-acre farmer, but cultivate forty acres, with myself and three boys, or perhaps I could have given the one acre more attention and had a larger yield, which I believe could have been made.

*A Maryland barrel is five bushels.

JUTE AS A PROTECTION TO GROWING COTTON.—A planter of Point Coupee Parish, Louisiana, has lately had his attention especially called to the cultivation of jute by the statement that in an adjoining parish cotton-worms did not attack a field of cotton surrounded by a row of jute. He says it has also been proven that the stems of the jute, after having been crushed by the rollers used in sugar-mills, are readily separated from the fiber.

DICKSON COTTON.—Of this variety a correspondent in Louisiana, who had planted seed received from the Department, is satisfied, by the experiments of two seasons, that with a favorable season and ordinary cultivation the yield would be 600 pounds of lint per acre. "The crop in this section did not average more than a bale to four acres, notwithstanding the great ravages of worms in July; but my Dickson cotton, having been planted early, in new ground, had so nearly matured that the worms injured it comparatively little—abandoning the tough leaves for those more tender in an adjoining field." The freedmen say that this cotton "picks better" than any other. However, our correspondent does not advise any planter to put his entire crop in this cotton, as it falls out very soon after opening, if not picked.

FULTZ WHEAT.—Mr. John A. Parker, of Tappahannock, Va., says he finds that sowing one-half bushel of this wheat to the acre is amply sufficient. It branches better than any other kind he has yet seen, and at the time of writing (January 18) shows much better than any fields of other kinds on which one and a half bushels per acre were sown. "The little parcel sent by the Department three years ago has caused a revolution in wheat-raising here."

MARKET-PRICES OF FARM-PRODUCTS.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of each month.

Articles.	February.	March.
NEW YORK.		
Flour, superfine State per barrel..	\$5 65 to \$6 20	\$5 70 to \$6 10
extra State.....do.....	6 45 to 7 00	6 40 to 6 80
superfine western.....do.....	5 65 to 6 20	5 70 to 6 10
extra to choice western.....do.....	6 35 to 11 00	6 30 to 11 00
common to fair southern extra.....do.....	6 70 to 7 75	6 60 to 7 55
good to choice choice southern.....do.....	7 80 to 11 00	7 60 to 11 00
Wheat, No. 1 spring.....per bushel..	1 58 to 1 62	1 52 to 1 58
No. 2 spring.....do.....	1 54 to 1 59	1 48 to 1 52
winter, red, western.....do.....	1 60 to 1 65	1 56 to 1 62
winter, amber, western.....do.....	1 66 to 1 70	1 63 to 1 66
winter, white, western.....do.....	1 60 to 1 93	1 60 to 1 85
Rye.....do.....	1 05 to 1 10	98 to 1 02
Barley.....do.....	1 80 to 2 10	— to 2 00
Corn.....do.....	81 to 90	76 to 80½
Oats.....do.....	60 to 63	61 to 63½
Hay, first quality.....per ton.....	26 00 to 28 00	23 00 to 27 00
second quality.....do.....	23 00 to 25 00	20 00 to 21 00
Beef, mess.....per barrel..	8 50 to 11 00	10 50 to 11 00
extra mess.....do.....	11 50 to 13 50	12 50 to 13 00

Market-prices of farm-products—Continued.

Articles.	February.		March.	
NEW YORK—Continued.				
Pork, mess.....per barrel..	\$16 00	to \$16 25	\$15 75	to \$15 80
extra prime.....do.....	13 75	to	13 50	to
prime mess.....do.....		15 00	14 25	to 14 50
Lard.....per pound..	9 $\frac{3}{4}$	to 10	9 $\frac{1}{2}$	to 9 $\frac{3}{4}$
Butter, western.....do.....	25	to 35	25	to 40
State dairy.....do.....	32	to 47	36	to 55
Cheese, State factory.....do.....	12 $\frac{3}{4}$	to 15 $\frac{1}{4}$	14 $\frac{1}{2}$	to 17
western factory.....do.....	12 $\frac{3}{4}$	to 15 $\frac{1}{4}$	14	to 16 $\frac{1}{2}$
Cotton, ordinary to good ordinary.....do.....	13	to 14 $\frac{1}{2}$	12 $\frac{1}{2}$	to 14 $\frac{1}{2}$
low middling to good middli'g. do.....	15	to 17 $\frac{1}{2}$	15	to 17 $\frac{3}{4}$
Sugar, fair to good refining.....do.....	7 $\frac{3}{4}$	to 7 $\frac{7}{8}$	7 $\frac{3}{4}$	to 7 $\frac{3}{4}$
prime refining.....do.....	8	to	7 $\frac{1}{2}$	to 7 $\frac{7}{8}$
Tobacco, lugs.....do.....	6 $\frac{1}{2}$	to 8	6 $\frac{1}{2}$	to 7 $\frac{1}{2}$
common to medium leaf.....do.....	8	to 10	8	to 10
Wool, American XXX and picklock.. do.....	62	to 70	60	to 65
American X and XX.....do.....	45	to 60	45	to 57 $\frac{1}{2}$
American, combing.....do.....	52	to 60	52	to 60
pulled.....do.....	45	to 52	25	to 50
California, spring-clipped.....do.....	18	to 35	18	to 52
California, fall-clipped.....do.....	20	to 29	19	to 28
Texas.....do.....	15	to 35	18	to 36
BOSTON.				
Flour, superfine, western.....per barrel..	5 50	to 6 00	5 25	to 6 00
western extras.....do.....	6 75	to 8 00	6 25	to 9 00
western choice.....do.....	8 50	to 11 00	9 50	to 10 50
southern extras.....do.....	6 50	to 7 00	6 25	to 6 75
choice Baltimore.....do.....	9 00	to 11 00	9 00	to 10 50
Wheat.....per bushel..	1 50	to 1 85	1 50	to 1 85
Rye.....do.....	1 00	to 1 05	1 05	to 1 10
Barley.....do.....	1 35	to 2 00	1 75	to 2 15
Corn.....do.....	84	to 93	85	to 88
Oats.....do.....	50	to 64	61	to 69
Hay, eastern and northern.....per ton..	18 00	to 25 00	18 00	to 25 00
western choice.....do.....	24 00	to 25 00	24 00	to 25 00
Beef, western mess.....per barrel..	10 00	to 12 00	10 00	to 12 00
western extra mess.....do.....	13 00	to 14 00	13 00	to 14 00
Pork, prime.....do.....	14 50	to 14 75	14 50	to 15 00
mess.....do.....	16 50	to 17 00	16 50	to 17 00
Lard.....per pound..	9 $\frac{3}{4}$	to 10 $\frac{1}{4}$	9 $\frac{3}{4}$	to 10 $\frac{1}{4}$
Butter, New York and Vermont.....do.....	32	to 40	33	to 44
western.....do.....	28	to 39	30	to 39
Cheese, N. Y. and Vt. factory.....do.....	13	to 15 $\frac{1}{2}$	15	to 17
western factory.....do.....	12	to 15 $\frac{1}{4}$	14	to 16 $\frac{1}{2}$
Sugar, fair to good refining.....do.....	7 $\frac{3}{4}$	to 8	7 $\frac{1}{2}$	to 7 $\frac{3}{4}$
Tobacco, lugs.....do.....	7 $\frac{1}{2}$	to 9	6 $\frac{1}{2}$	to 8
common to medium leaf.....do.....	9	to 10 $\frac{1}{2}$	8 $\frac{1}{2}$	to 10
Cotton, ordinary to good ordinary.....do.....	13	to 15	12 $\frac{1}{2}$	to 14 $\frac{1}{2}$
low middling to good middling. do.....	15 $\frac{1}{4}$	to 18	15 $\frac{1}{4}$	to 18
Wool, Ohio and Pennsylvania.....do.....	50	to 65	50	to 65
Michigan.....do.....	45	to 54	45	to 53
other western.....do.....	44	to 52	44	to 52
pulled.....do.....	25	to 60	25	to 60
combing-fleece.....do.....	55	to 60	55	to 60
California.....do.....	17	to 36	17	to 36
Texas.....do.....	20	to 37	20	to 37

PHILADELPHIA.

Flour, superfine per barrel..	5 25	to 5 75	5 00	to 5 75
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Market-prices of farm products—Continued.

Articles.	February.	March.
PHILADELPHIA—Continued.		
Flour, Pennsylvania extra per barrel..	\$6 00 to \$6 50	\$6 00 to \$7 00
Pennsylvania family and fancy ..do.....	8 12½ to 8 50	7 50 to 8 12½
western extra .....do.....	6 00 to 8 25	6 00 to 7 75
western family .....do.....	8 50 to 10 50	8 37½ to 10 25
Wheat, winter, red .....per bushel..	1 56 to 1 74	1 60 to 1 71
winter, amber .....do.....	1 65 to 1 78	1 70 to 1 73
winter, white .....do.....	1 60 to 1 85	1 78 to 1 85
spring .....do.....	1 60 to 1 65	1 50 to 1 55
Rye .....do.....	95 to 96	90 to 92
Barley .....do.....	1 95 to 2 20	1 90 to 2 25
Corn .....do.....	76 to 86	72 to 76
Oats .....do.....	55 to 65	57 to 65
Hay, fresh, baled .....per ton..	23 00 to 24 00	23 00 to 24 00
common to fair shipping .....do.....	20 00 to 22 00	20 00 to 22 00
Beef, western mess .....per barrel..	8 00 to 10 00	8 00 to 10 00
extra mess .....do.....	9 00 to 12 00	9 00 to 12 00
Warthman's city family .....do.....	16 00 to —	15 50 to —
Pork, mess .....do.....	16 50 to 16 75	16 00 to 16 50
prime mess .....do.....	15 00 to —	15 00 to —
prime .....do.....	13 00 to —	13 00 to —
Lard .....per pound..	9½ to 12½	9½ to 12
Butter, choice middle State .....do.....	40 to 45	42 to 48
choice western .....do.....	33 to 38	40 to 42
Cheese, New York factory, choice .....do.....	16 to 17	16 to 17
Ohio factory .....do.....	13 to 16	14 to 16
Sugar, fair to good refining .....do.....	7¾ to 8	7½ to 7¾
Cotton, ordinary to good ordinary .....do.....	13 to 14¾	12¾ to 14¾
low middling to good middling ..do.....	15½ to 17½	15½ to 17½
Wool, Ohio X and XX .....do.....	52 to 56	51 to 56
Ohio combing .....do.....	62½ to 65	60 to 62
pulled .....do.....	48 to —	40 to 51
unwashed, cloth'g and comb'g ..do.....	36 to 44	35½ to 42
BALTIMORE.		
Flour, superfine .....per barrel..	5 50 to 6 50	5 25 to 6 00
extra .....do.....	6 50 to 8 00	6 00 to 6 75
family and fancy .....do.....	7 50 to 11 00	7 25 to 11 00
Wheat, white, fair to choice .....per bushel..	1 75 to 1 90	1 70 to 1 85
amber .....do.....	1 60 to 1 95	1 60 to 1 80
red .....do.....	1 60 to 1 90	1 50 to 1 80
Rye, common to prime .....do.....	96 to 98	90 to 91
Corn, white, southern .....do.....	76 to 83	70 to 75
yellow, southern .....do.....	73 to 78	70 to 74
Oats, southern .....do.....	54 to 58	55 to 58
western .....do.....	54 to 58	55 to 57
Hay, Pennsylvania .....per ton..	20 00 to 24 00	18 00 to 22 00
Maryland .....do.....	23 00 to 26 00	23 00 to 25 00
western .....do.....	— to 23 00	20 00 to 22 00
Beef, Baltimore mess .....per barrel..	15 00 to 20 00	15 00 to 20 00
extra .....do.....	23 00 to 25 00	23 00 to 25 00
Pork, mess .....do.....	16 50 to —	16 00 to 16 25
Lard .....per pound..	9¾ to 10	8½ to 9
Butter, western .....do.....	30 to 40	30 to 38
eastern .....do.....	35 to —	34 to 35
Cheese, eastern cutting .....do.....	15½ to 16	16½ to 17
western cutting .....do.....	14¾ to 15	15½ to 16
Sugar, fair to good refining .....do.....	7¾ to 8	7½ to —
Tobacco, lugs .....do.....	5 to 7	5 to 8
common to medium, leaf .....do.....	7 to 9	7 to 9
Cotton, ordinary to good ordinary .....do.....	14 to —	13 to 14½
low middling to middling .....do.....	15 to 16	14¾ to 16

Market-prices of farm products—Continued.

Articles.	February.	March.
BALTIMORE—Continued.		
Wool, fleece, com. to fine.....per pound..	\$0 45 to \$0 50	\$0 45 to \$0 50
tub.....do.....	55 to 60	55 to 60
unwashed.....do.....	35 to 38	35 to 38
pulled.....do.....	35 to 40	35 to 40
CINCINNATI.		
Flour, superfine.....per barrel..	5 25 to 5 75	5 00 to 5 50
extra.....do.....	6 65 to 7 00	6 40 to 6 75
family and fancy.....do.....	7 25 to 8 25	6 80 to 8 00
Wheat, red winter.....per bushel..	1 48 to 1 50	1 35 to 1 43
hill.....do.....	1 55 to 1 63	1 45 to 1 50
white winter.....do.....	1 65 to 1 70	1 48 to 1 55
Rye.....do.....	94 to 96	1 01 to 1 02
Barley.....do.....	1 60 to 1 85	1 70 to 1 85
Corn.....do.....	60 to 65	57 to 62
Oats.....do.....	46 to 54	45 to 52
Hay, baled, No. 1.....per ton.....	15 00 to 16 00	14 00 to 15 00
lower grades.....do.....	10 00 to 14 00	9 00 to 14 00
Beef, plate.....per barrel..	14 00 to —	14 00 to —
Pork, mess.....do.....	15 50 to —	14 25 to 14 50
Lard.....per pound..	9 to 10 $\frac{1}{2}$	8 $\frac{1}{2}$ to 9
Butter, choice.....do.....	34 to 38	38 to 40
prime.....do.....	31 to 33	35 to 36
Cheese, factory.....do.....	16 to 17	16 $\frac{1}{2}$ to 17
pine-apple.....do.....	22 to 23	22 to 23
Sugar, New Orleans, fair to good.....do.....	8 $\frac{1}{2}$ to 9 $\frac{1}{2}$	8 $\frac{1}{2}$ to 9 $\frac{1}{2}$
prime to choice.....do.....	9 $\frac{3}{4}$ to 10 $\frac{1}{4}$	9 $\frac{1}{2}$ to 10
Tobacco, lugs.....do.....	6 $\frac{1}{2}$ to 12	9 to 12
leaf.....do.....	7 to 25	15 to 25
Cotton, ordinary to good ordinary.....do.....	11 $\frac{1}{2}$ to 13 $\frac{1}{2}$	11 $\frac{1}{4}$ to 13 $\frac{1}{4}$
low middl'g to good middl'g.....do.....	14 $\frac{1}{2}$ to 15 $\frac{1}{2}$	14 $\frac{1}{4}$ to 16 $\frac{1}{4}$
Wool, fleece-washed, com. to fine.....do.....	45 to 47	45 to 47
tub-washed.....do.....	48 to 49	48 to 49
unwashed, clothing.....do.....	30 to 32	30 to 32
unwashed, combing.....do.....	33 to 35	33 to 35
pulled.....do.....	35 to 38	35 to 38
CHICAGO.		
Flour, white winter, fair to good.....per barrel..	6 50 to 7 50	6 50 to 7 50
white winter, choice.....do.....	7 75 to 9 25	7 75 to 9 25
red winter.....do.....	6 00 to 7 75	5 75 to 7 50
medium to fancy, spring extra.....do.....	6 00 to 6 75	5 00 to 6 75
spring, superfine.....do.....	3 00 to 5 00	3 00 to 4 50
Wheat, No. 1 spring.....per bushel..	1 23 $\frac{3}{4}$ to 1 24	1 19 to 1 20
No. 2 spring.....do.....	1 22 $\frac{1}{2}$ to 1 23 $\frac{1}{2}$	1 16 $\frac{3}{4}$ to 1 17 $\frac{1}{4}$
No. 3 spring.....do.....	1 15 to 1 16	1 12 $\frac{1}{2}$ to —
Corn, No. 2.....do.....	51 $\frac{1}{2}$ to 58 $\frac{1}{2}$	53 $\frac{1}{2}$ to 57 $\frac{1}{2}$
Oats, No. 2.....do.....	42 to 42 $\frac{1}{2}$	42 $\frac{1}{2}$ to 42 $\frac{3}{4}$
Rye, No. 2.....do.....	81 to 82	84 $\frac{1}{2}$ to 85 $\frac{1}{2}$
Barley, No. 2.....do.....	1 95 to 2 05	1 59 to —
Hay, timothy.....per ton.....	10 00 to 14 00	10 00 to 14 50
prairie.....do.....	6 00 to 9 00	6 00 to 9 50
Beef, mess.....per barrel..	8 25 to 8 50	8 75 to 9 00
extra mess.....do.....	9 75 to 10 00	9 75 to 10 00
Pork, mess.....do.....	14 40 to 14 42 $\frac{1}{2}$	13 85 to 14 00
prime mess.....do.....	12 75 to 13 00	12 25 to 12 50
extra prime.....do.....	12 00 to 12 25	11 00 to 11 25
Lard.....per cental..	9 30 to 9 75	8 55 to 8 57 $\frac{1}{2}$
Butter, choice to fancy.....per pound..	33 to 37	38 to 43
medium to good.....do.....	25 to 31	30 to 35

Market-prices of farm products—Continued.

Articles.	February.		March.	
CHICAGO—Continued.				
Cheese, New York factory .....per pound..	\$0 16	to \$0 17½	\$0 17	to \$0 18
Ohio and western factory .....do.....	15½	to 16½	16	to 17
Sugar, New Orleans, prime to choice..do.....	9	to 9¾	9	to 9¾
common to fair..do.....	7¾	to 8¾	7½	to 8¾
Wool, tub-washed, common to prime .do.....	48	to 55	48	to 55
fleece-washed.....do.....	36	to 48	37	to 48
unwashed.....do.....	25	to 34	25	to 32
pulled.....do.....	35	to 40	35	to 40
SAINT LOUIS.				
Flour, spring .....per barrel..	4 50	to —	4 85	to —
winter .....do.....	5 95	to 9 75	4 50	to 8 75
Wheat, red winter.....per bushel..	1 40	to 1 67	1 30	to 1 42
white winter .....do.....	1 50	to 1 70	1 50	to 1 62
spring .....do.....	1 24	to 1 37½	1 19	to 1 19½
Corn .....do.....	61	to 70	55	to 67
Rye .....do.....	85	to 85½	92½	to 95
Oats.....do.....	44½	to 49	46	to 52
Barley.....do.....	1 50	to 1 85	1 75	to 1 80
Hay, timothy.....per ton.....	16 00	to —	14 50	to 19 00
Beef, prime mess .....per barrel..	11 00	to —	—	to —
mess .....do.....	12 00	to —	—	to —
extra mess .....do.....	13 00	to —	13 00	to —
Pork, mess.....do.....	15 25	to 15 50	14 75	to 15 00
Lard .....per pound..	7¾	to 9¾	8	to 9½
Butter, choice.....do.....	28	to 33	36	to 38
inferior grades.....do.....	25	to 30	25	to 34
Cheese, Ohio and N. W. factory .....do.....	15½	to 16	16	to 16½
New York factory .....do.....	16	to 16½	16	to 16½
Sugar, New Orleans, common to fair..do.....	9	to —	9	to —
prime to choice .do.....	9½	to 10	—	to 10½
Cotton, ordinary to good ordinary.....do.....	11	to 13	—	to —
low middling to good middling.....do.....	14½	to 16½	—	to —
Wool, tub-washed.....do.....	48	to 53	47	to 53
unwashed, combing .....do.....	30	to 34	31	to 35
fleece.....do.....	28	to 32	40	to 46½
NEW ORLEANS.				
Flour, superfine .....per barrel..	5 50	to 5 75	5 25	to —
extra .....do.....	5 90	to 7 25	5 62½	to 7 50
choice to fancy .....do.....	7 50	to 9 75	7 75	to 9 75
Corn, white .....per bushel..	72	to 75	75	to 77
yellow .....do.....	—	to 75	—	to 82
Oats.....do.....	57	to 58	63	to —
Hay, choice .....per ton.....	23 00	to 24 00	—	to —
prime .....do.....	22 00	to —	21 00	to —
Beef, Texas.....per barrel..	12 00	to —	12 00	to —
Philadelphia .....do.....	16 00	to 16 25	16 00	to 16 25
Fulton Market.....half barrel..	12 00	to —	12 00	to —
western .....do.....	9 00	to 9 25	—	to —
Pork, mess .....per barrel..	15 62½	to 15 75	16 00	to —
Lard .....per pound..	9	to 9¾	9	to 10
Butter, choice Goshen .....do.....	40	to 42	33	to 43
western .....do.....	27	to 35	28	to 38
Cheese, choice western factory .....do.....	14½	to —	17	to —
New York cream.....do.....	17½	to —	17	to —
Sugar, fair to fully fair .....do.....	6½	to 8	7	to 7½
prime to strictly prime .....do.....	8½	to 8½	8½	to —
clarified, white and yellow.....do.....	9½	to 10½	8	to 9¾
Cotton, ordinary to good ordinary.....do.....	11½	to 14½	11½	to 13½

Market-prices of farm products—Continued.

Articles.	February.	March.
NEW ORLEANS—Continued.		
Cotton, low middling to good middling per pound	\$0 15 $\frac{3}{4}$ to \$0 17 $\frac{3}{4}$	\$0 14 $\frac{3}{4}$ to \$0 17 $\frac{3}{4}$
Tobacco, lugs .....do.....	5 $\frac{1}{2}$ to 7 $\frac{3}{4}$	5 to 6 $\frac{1}{2}$
low leaf to medium leaf .....do.....	7 $\frac{3}{4}$ to 9 $\frac{3}{4}$	6 $\frac{1}{2}$ to 8
Wool, lake .....do.....	25 to —	— to —
SAN FRANCISCO.		
Flour, superfine .....per barrel..	5 50 to 5 75	5 25 to 5 50
extra .....do.....	6 00 to —	5 75 to 6 00
family and fancy .....do.....	6 50 to 7 00	6 25 to 6 50
Wheat, California .....per cental..	2 15 to 2 25	1 85 to 1 95
Oregon .....do.....	2 15 to 2 25	1 85 to 1 95
Barley .....do.....	1 40 to 1 65	1 45 to 1 75
Oats .....do.....	1 50 to 1 80	1 45 to 1 75
Corn, white .....do.....	1 60 to 1 65	1 65 to 1 70
yellow .....do.....	1 60 to 1 65	1 65 to 1 75
Hay, State .....per ton..	14 00 to 17 00	12 50 to 16 50
Beef, mess .....per barrel..	9 50 to 10 00	9 00 to 9 50
family mess .....per half barrel..	9 00 to 10 00	9 00 to 10 00
Pork, mess .....per barrel..	18 00 to 18 50	17 00 to 17 50
prime mess .....do.....	17 50 to 18 00	17 50 to 18 00
Lard .....per pound..	10 to 11	10 to 11
Butter, overland .....do.....	15 to 25	15 to 25
California .....do.....	30 to 38	30 to 38
Oregon .....do.....	15 to 20	15 to 20
Cheese .....do.....	12 to 18	12 to 18
Wool, native .....do.....	14 to 16	14 to —
California .....do.....	18 to 22	18 to —
Oregon .....do.....	18 to 22	18 to —

LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra beeves .....per cental..	\$12 50 to \$12 75	\$12 00 to \$13 00
good to prime .....do.....	11 75 to 12 25	11 50 to 12 25
common to fair .....do.....	10 00 to 11 50	9 75 to 11 25
poorest grade .....do.....	8 50 to 9 00	8 00 to 9 00
average .....do.....	10 50 to 11 50	10 50 to 11 00
Texans .....do.....	8 00 to 10 50	8 50 to 10 25
milch-cows .....per head..	40 00 to 80 00	40 00 to 80 00
calves, grain-fed .....do.....	8 00 to 13 00	8 00 to 15 00
Sheep, ordinary to extra .....per cental..	6 50 to 8 12 $\frac{1}{2}$	6 00 to 8 00
Swine, common to fair .....do.....	6 25 to 6 75	6 62 to 7 25
BOSTON.		
Cattle, choice .....per cental..	7 00 to 7 25	6 75 to 7 25
extra .....do.....	6 00 to 6 50	6 00 to 6 50
first quality .....do.....	5 00 to 5 50	5 25 to 5 75
second quality .....do.....	4 00 to 4 75	4 00 to 5 00
third quality .....do.....	3 75 to —	3 75 to —
working-oxen .....per pair..	100 00 to 250 00	100 00 to 250 00
milch-cows with calves .....per head..	35 00 to 95 00	35 00 to 95 00
yearlings .....do.....	10 00 to 18 00	10 00 to 18 00
Sheep, extra .....do.....	5 00 to 6 00	5 00 to 7 25
inferior grades .....do.....	3 00 to 4 50	3 50 to 4 75
Swine .....per cental..	6 50 to 6 75	6 50 to 6 75

Live-stock markets—Continued.

Articles.	February.		March.	
PHILADELPHIA.				
Cattle, common to choice.....per cental..	\$4 00	to \$7 75	\$4 00	to \$8 00
Sheep, common to choice .....do.....	5 00	to 7 25	5 50	to 7 50
Swine, corn-fed .....do.....	9 25	to 9 50	8 50	to 9 00
BALTIMORE.				
Cattle, best beeves.....per cental..	5 75	to 6 87	5 75	to 7 00
first quality.....do.....	4 50	to 5 75	4 62	to 5 75
medium .....do.....	4 00	to 4 50	4 00	to 4 62
ordinary.....do.....	3 00	to 4 00	3 50	to 4 00
general average .....do.....	4 75	to —	4 75	to —
most of the sales between .....do.....	4 25	to 5 62	4 25	to 5 25
Sheep .....do.....	4 00	to 7 00	2 50	to 7 75
Swine .....do.....	7 25	to 8 25	7 25	to 8 25
CINCINNATI.				
Cattle, good to prime butchers' steers, per cental..	4 75	to 5 50	5 25	to 5 50
common to good medium .....do.....	4 00	to 4 50	3 25	to 5 00
milch-cows .....do.....	30 00	to 50 00	25 00	to 65 00
Sheep, common .....do.....	2 25	to 4 25	4 50	to —
good to prime butchers' .....do.....	4 50	to 5 50	—	to 6 00
Swine, shipping grades.....do.....	5 50	to 6 00	5 10	to 5 70
good to prime butchers' .....do.....	6 00	to 6 25	5 90	to 6 00
CHICAGO.				
Cattle, extra-graded steers, 1,400 to 1,500 pounds.....per cental..	5 75	to 6 25	5 85	to 6 25
choice beeves, 3 to 5 years old, 1,250 to 1,450 pounds .....per cental..	5 20	to 5 50	5 40	to 5 70
good beeves, 1,200 to 1,300 pounds, per cental..	4 75	to 5 10	5 10	to 5 30
medium grades, 1,150 to 1,500 pounds per cental..	4 50	to 4 70	4 75	to 5 00
lower grades, natives .....do.....	1 75	to 4 00	2 00	to 4 50
Texans, choice corn-fed.....do.....	4 00	to 4 60	4 25	to 4 75
Texans, north-wintered.....do.....	3 00	to 3 50	3 25	to 4 00
Texans, through droves.....do.....	1 75	to 2 75	2 00	to 3 00
milch cows .....per head..	20 00	to 50 00	20 00	to 45 00
veal calves .....do.....	3 00	to 5 00	3 50	to 5 75
Sheep, poor to medium .....do.....	3 75	to 4 50	4 00	to 5 25
good to choice .....do.....	4 75	to 5 50	5 50	to 6 25
Swine, good to extra .....do.....	5 40	to 5 75	5 30	to 6 30
inferior to medium .....do.....	4 80	to 5 30	4 25	to 5 00
SAINT LOUIS.				
Cattle, choice native steers, 1,300 to 1,600 pounds.....per cental..	5 75	to 6 25	5 50	to 6 00
prime second-class, 1,150 to 1,400 pounds .....per cental..	4 50	to 5 00	4 75	to 5 00
good third-grade, 1,050 to 1,300 pounds per cental..	3 50	to 4 00	3 75	to 4 00
fair butchers' steers, 1,000 to 1,200 pounds .....per cental..	3 25	to 3 50	3 50	to 3 75
inferior native grades .....do.....	2 50	to 3 75	2 50	to 3 75
Texans and Cherokees, corn-fattened per cental..	2 00	to 4 00	3 00	to 3 25
through droves .....do.....	1 50	to 2 50	1 75	to 3 75

Live-stock markets—Continued.

Articles.	February.		March.	
SAINT LOUIS—Continued:				
Sheep.....per cental..	\$4 50	_____	_____	to \$5 00
Swine.....do.....	\$4 90 to	\$5 65	\$4 90 to	5 30
Horses, plugs.....per head..	30 00 to	60 00	30 00 to	60 00
street-car horses.....do.....	80 00 to	90 00	80 00 to	90 00
good work-horses.....do.....	85 00 to	100 00	85 00 to	100 00
driving horses.....do.....	100 00 to	140 00	100 00 to	140 00
heavy draught-horses.....do.....	125 00 to	165 00	125 00 to	165 00
Mules, 14 to 15 hands high.....do.....	50 00 to	100 00	50 00 to	100 00
15 to 16 hands high.....do.....	115 00 to	165 00	115 00 to	165 00
extra.....do.....	150 00 to	200 00	150 00 to	250 00
NEW ORLEANS.				
Cattle, Texas beeves, choice.....per head..	45 00 to	_____	45 00	_____
Texas beeves, first quality.....do.....	35 00 to	40 00	35 00 to	40 00
second quality.....do.....	20 00 to	28 00	20 00 to	28 00
Western beeves.....per cental..	10 00 to	12 50	8 00 to	10 00
Milch-cows.....per head..	35 00 to	100 00	35 00 to	100 00
Calves.....do.....	7 00 to	10 00	7 00 to	10 00
Sheep, first quality.....do.....	4 00 to	5 00	4 00 to	5 00
second quality.....do.....	3 00 to	4 00	3 00 to	4 00
Swine.....per cental..	6 00 to	7 50	5 00 to	7 00

FOREIGN MARKETS.

WHEAT.—The weather in Europe has been remarkably mild since the opening of 1874, but a sharp frost during the second week of February checked the dangerous forwardness of vegetation and greatly benefited the soil for spring crops. From the continent comes a complaint of lack of snow to cover the winter crops. The mild weather in the United States greatly favored the continued shipment of grain. Both English and French deliveries of wheat were increasingly short, owing to the exhaustion of stocks in first hands. The deficiency of English home-supplies, however, was more than met by copious foreign imports. The Bengal famine is influencing the European markets by diverting supplies from Australia. The weekly deliveries of English grain are at least 10,000 quarters short of last year, while in France strong inducements are necessary in order to bring native produce to market. The effects of the American monetary crisis were visible in the increased sensitiveness to English advices in the New York markets. The deficiency in the English markets must be mainly supplied from America, from which at least half the late foreign arrivals have come.

The imports of wheat into the United Kingdom, during the second week in February, amounted to 594,340 cwts. The London market opened the following week with small supplies of English wheat and no great stock of foreign, half the latter being from America. The show of fresh samples from counties near London was limited and poor. The London averages were 65s. 8d. on 1,299 quarters. In Paris holders were successfully resisting further decline, the new offers being scanty; good

white wheat ranged from 64s. to 70s. per quarter; Spanish white, from Marseilles, was offered at 69s. per quarter; American spring at 64s. per quarter.

In Mark Lane, Essex, and Kent, new white was quoted at 54s. to 67s. per quarter; ditto red, 56s. to 64s.; Norfolk, Lincolnshire, and Yorkshire, new red, 55s. to 62s. Of foreign wheat, Dantzic mixed brought 61s. to 71s.; Königsberg 61s. to 70s.; Rostock, 63s. to 70s.; Silesian red, 58s. to 60s.; ditto white, 63s. to 65s.; Pomeranian, Mecklenberg, and Uckermark red, 61s. to 63s.; Russian hard, 54s. to 57s.; Saxonska, 61s. to 62s.; Danish and Holstein red, 61s. to 63s.; American, 58s. to 60s.; Chilian white, 64s.; Californian, 67s.; Australian, 69s. to 71s.

In Liverpool the import-trade was declining but the exports were increasing. American white, per cental, brought 13s. to 13s. 6d.; ditto red winter and southern, 12s. 4d. to 13s.; ditto No. 1 spring, 12s. to 12s. 2d.; ditto No. 2 spring, 11s. 6d. to 11s. 10d.; Canadian white, 13s. to 13s. 4d.; ditto red, 12s. 2d. to 12s. 4d.; Californian white, 12s. 10d. to 13s. 8d.; Chilian white, 12s. 4d.; Australian white, 14s. to 14s. 2d.; Spanish white, 12s. 10d. to 13s.; Danubian, 7s. to 9s.; Ghirka, 11s. 6d. to 12s.; Egyptian, 10s. 10d. to 12s. 9d.

FLOUR.—The supplies of both English and foreign flour were quite moderate in London in the third week of February. Trade was dull, but holders were not disposed to lower the rates. The Paris market suddenly declined 3 francs per 157 kilograms in the face of declining supplies of wheat, the range being from 49s. 4d. to 51s. 4d. per 280 pounds. In Mark Lane the best town household flour brought from 50s. to 57s. per 280 pounds; best country household 45s. to 47s.; Norfolk and Suffolk, 39s. to 44s. American flour, per barrel, 28s. to 30s.; extra, 30s. to 32s. In Liverpool English and Irish superfines, 44s. to 45s. 6d. per 280 pounds; ditto extra, 45s. 6d. to 50s.; French, 56s. to 60s.; Spanish, 49s. to 52s. 6d.; Trieste and Hungarian, 66s. to 78s.; Chilian and Californian, 46s. to 52s.; American Western State, per barrel, 30s. to 32s.; extra State, 31s. to 33s.; Baltimore and Philadelphia, 30s. to 32s.; Ohio, 31s. to 35s.; Canadian, 33s. to 37s.

MAIZE.—In Mark Lane, American white was quoted at 40s. to 43s. per quarter; ditto red, 36s. to 38s. In Liverpool, American white, 39s.; ditto yellow, 37s.; Danubian, 37s. 6d. to 38s.; Galatz, 40s.

WOOL.—The London wool trade has become firmer. Business not remarkably brisk in English wools, but steady. Colonial wools are steady at current rates.

LIVE STOCK.—The cattle trade was quiet but firmer on account of short supplies. Coarse and inferior beasts brought 4s. 6d. to 4s. 10d. per 8 pounds; second quality, 4s. 10d. to 5s.; prime large oxen, 5s. 6d. to 5s. 8d.; prime scots, 5s. 8d. to 5s. 10d.; coarse and inferior sheep, 5s. to 5s. 6d.; second quality, 5s. 6d. to 5s. 10d.; prime coarse wooled, 6s. 6d. to 6s. 8d.; prime southdowns, 6s. 8d. to 6s. 10d.; large coarse calves, 5s. to 5s. 6d.; prime small calves, 6s. to 6s. 4d.; large hogs, 3s. 6d. to 3s. 10d.; small porkers, 4s. 4d. to 4s. 6d.

TRADE OF ODESSA.

Odessa, at the head of the Black Sea, is the grand emporium of Southern Russia. It was made a free port in 1817, a privilege which, in connection with its admirable commercial position, has given it a practical monopoly of the trade of Southeastern Europe in the export of

grain and other agricultural products. Regular official bulletins are issued monthly, and sometimes more frequently, showing the extent and value of its commercial operations. From two bulletins issued January 12 and January 15, 1874, and signed by H. Willenz and Simon Bernstein, *courtiers-jurés*, are gathered the following statistics of the trade of 1873:

The course of trade during the year was marked by numerous fluctuations, sympathizing with changes in foreign markets. In the middle of the year prices were very high, and in almost every case higher, in proportion, than in the markets of consumption. The reason of this is found in the great rise of prices in other markets, coming upon the heels of the very poor crops of the regions adjacent to Odessa. It was necessary to depend upon arrivals from the north of Bessarabia, from the governments of Kieff and Podolia, where cereal crops were good in quantity and very satisfactory in quality—in fact, finer than for many years. The campaign was opened at prices unexampled at that period of the year and such as were customary only at its close.

During the entire year, in spite of declining movements in the great markets of consumption, prices at Odessa were, with slight variations, constantly sustained. This was the result of light stocks in depot. A daily accretion of 25,000 to 30,000 tchetverts by rail, and 40,000 to 50,000 by way of the Dnieper, scarce met the wants of the local and coast trade, a branch of commerce already large and constantly increasing.

The wool-business was almost neglected till the end of May. Important purchases on French account, at the fair of Charkoff, during June, produced a rise of 2 roubles the poud, in the price of fine wools in grease, raising the quotations to 10 roubles the poud. The rouble is the standard silver coin of Russia, but varies in value, according to date of coinage, from 73 cents to 80 cents. The poud is equal to 36.06764 pounds. Russian purchasers declined purchasing at these enhanced prices, and the former calm was re-instated as the prices abroad gradually declined. Washed fine wool was neglected the whole year, the prices ranging from 24 to 27 roubles the poud. White Donskoi was in but moderate demand at 10½ roubles the poud.

No commercial disasters were experienced during the year. The financial crises of Austria, Germany, and America necessarily produced some stagnation in business, lowering prices, and compelling some holders to realize at a loss. Russia, among commercial countries, was least affected by these crises, yet its enlarged speculations, provoked by the inflation of currency, felt the spasmodic contraction severely. The commerce of Odessa suffered but little from the reaction compared with other great marts of Europe. A decline in imports is noted as one of the results of the crisis, but the prospects of an enlarged business were quite satisfactory.

The stability of exchanges, which, in the report of 1872, was referred to the monetary unity of Odessa trade, was still more marked and satisfactory during the critical year of 1873. The range of fluctuation was quite limited. London exchanges varied from 7.30½ to 7.48½, against 7.22 to 7.41½ in 1872; Marseilles from 3.42½ to 3.50, against 3.46 to 3.56½ in 1872.

The following tables will give a general idea of the commercial transactions of 1872 and 1873:

Cereals and seeds purchased and placed in warehouses.	1872.		1873.	
	Quantity.	Price in roubles.	Quantity.	Price in roubles.
Soft wheat.....tchetverts..	733,500	7.55 to 12.62½	390,300	9.55 to 14.63½
Sandomirca.....do.....	87,390	9.70 to 12.50	38,000	9.75 to 14.00
Ghirca.....do.....	1,363,100	8.25 to 13.05	712,000	9.50 to 15.00
Do.....pounds.....	749,300	.82 to 1.26	733,500	1.12 to 1.40
Hard wheat.....tchetverts..	6,900	8.50 to 10.75	1,400	13.00 to 14.00
Rye.....do.....	308,500	4.25 to 6.62½	194,700	5.30 to 8.20
Maize.....do.....	47,300	5.25 to 6.62½	419,200	5.45 to 8.50
Barley.....do.....	92,600	3.80 to 4.55	35,300	4.25 to 6.25
Oats.....do.....	40,900	11.95 to 13.80	2,800	3.40 to —
Flaxseed.....do.....	22,700	4.00 to 6.12½	35,400	11.50 to 13.62½
Rape-seed.....do.....	2,600	10.75 to 11.50	9,700	4.12½ to 6.80
Colza.....do.....			9,700	10.50 to 11.62½

Total grains and seeds 1872, 3,454,700 tchetverts; 1873, 2,582,000 tchetverts.

Decrease 872,700 tchetverts.

A tchetvert is equal to 5.95205 bushels.

The stocks of grains and seeds, in tchetverts, remaining in warehouse at the close of 1872 and 1873, respectively, were as follows: Soft wheat, 140,000 and 346,000; Sandomirca, 30,500 and 95,000; Ghirca, 698,000 and 350,000; hard wheat, 135,000 and 6,000; rye, 171,000 and 40,000; maize, 53,500 and 11,000; barley, 46,000 and 13,000; oats, 14,500 and 11,000; flaxseed, 13,000 and 11,000; rape-seed, 8,000 and 11,000; colza, 3,000 and 9,000; pease, 3,500 and 1,400; total grains and seeds, 1,194,500 and 904,400.

The exports of grains and seeds, in tchetverts, during 1873 were in round numbers as follows:

Countries.	Wheat.	Rye.	Maize.	Barley.	Oats.	Pease.	Flax-seed.	Colza and rape seed.	Total to each country.
United Kingdom	1,423,000	108,900	307,700	82,250	2,100	5,200	36,500	25,800	1,991,450
France	498,900	2,100	70,800	2,000	149,100	3,500	5,800	22,700	754,900
Turkey, Greece, and the Danube.	11,100	5,700	.....	1,300	2,400	1,700	2,600	.....	24,800
Austria	235,100	3,100	41,800	6,100	17,600	800	.....	.....	304,500
Italy	76,900	14,100	7,700	.....	11,900	50	4,500	.....	115,150
Belgium	218,100	72,500	.....	27,500	.....	100	17,300	23,000	358,500
Germany .....	.....	46,400	.....	.....	.....	.....	.....	.....	46,400
Other countries	13,800	15,900	.....	.....	.....	.....	.....	.....	29,700
Total { in 1873	2,476,900	268,700	428,000	119,150	183,100	11,350	66,700	71,500	3,625,400
{ in 1872	3,338,000	363,600	57,800	315,250	46,000	13,050	151,800	115,500	4,901,000

The exports of flour and meal, in pounds, during 1873, were as follows: United Kingdom, 182,600; France, 500; Turkey, Greece, and the Danube, 347,100; Austria, 850; total, 531,050, against 752,100 in 1872.

Of tallow the stock on hand at the close of 1873 embraced 10,000 pounds of mutton and 6,000 pounds of beef. During the year the exports were 700 pounds to the United Kingdom; 800 pounds to France; 6,000 pounds to Turkey, Greece, and the Danube; 250 pounds to Austria; total, 7,750 pounds against 40,600 pounds in 1872.

The exports of wool, in pounds, during 1873, were as follows: United Kingdom, 132,500; France, 44,700; Turkey, Greece, and the Danube, 12,800; Austria, 18,500; Belgium, 2,000; total, 210,500, against 334,100 in 1872.

During 1873, 922 vessels left Odessa with cargoes direct to foreign ports; of these 349 were sailing-vessels and 573 steamers.

The nationalities of the sailing-vessels were as follows: Italian, 128; Austrian, 116; Greek, 37; English, 18; German, 17; Norwegian, 14; Russian, 11; Turkish, 8; total, 349, against 541 in 1872 and 797 in 1871.

The nationalities of the steamers were as follows: English, 259; Russian, 178; Austrian, 88; Italian, 18; Belgian, 16; Dutch, 10; Danish, 2; German, 2; total, 573, against 504 in 1873 and 425 in 1871. The trade is rapidly passing from sailing-vessels to steamers.

There were in port January 1, 1873, 35 vessels; arrivals during the year, 1,373; departures, 1,391; in port January 1, 1874, 17 vessels.

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